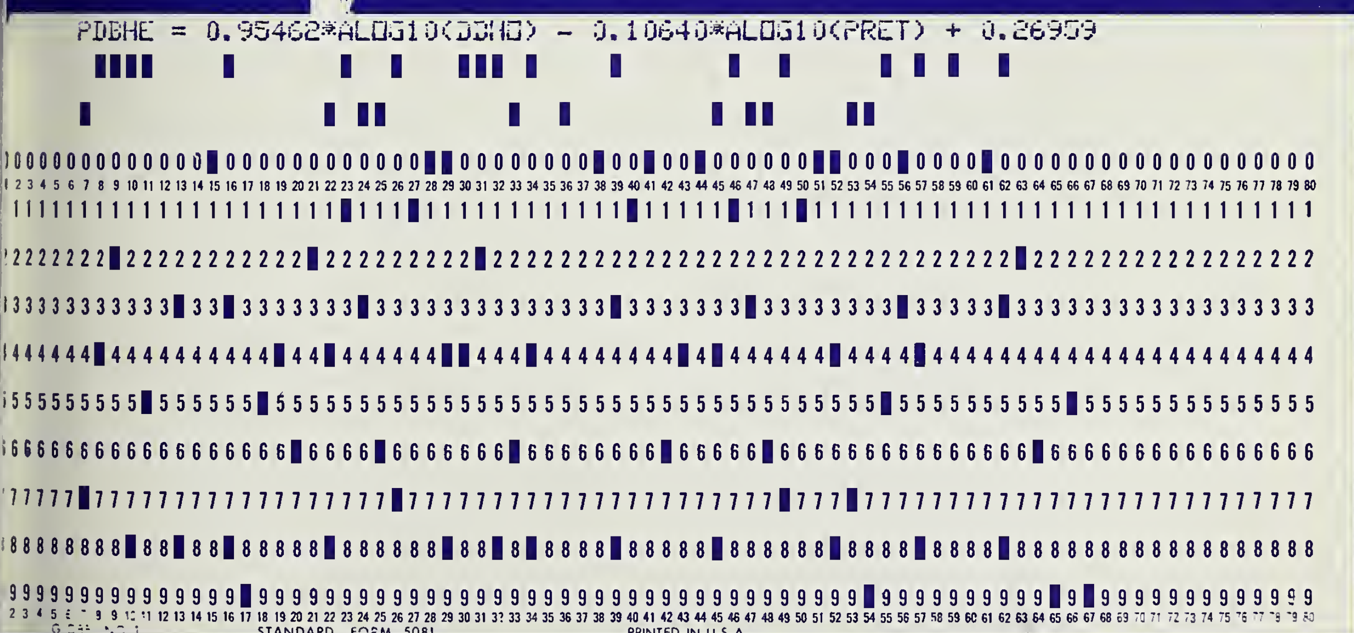
USDA Forest Service
Research Paper RM-63
October 1970

computer-assisted timber inventory analysis and management planning

by Clifford A. Myers

Rocky Mountain Forest and Range Experiment Station
U.S. Department of Agriculture
Forest Service



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ABSTRACT

Presents computer programs, written in Fortran IV, for analysis of inventory data, computation of actual and optimum growing stocks and allowable cuts, and computation of other values needed for forest management planning. Computed volumes and areas are summarized in a timber management guide that replaces a conventional management plan. Effects of cultural operations and other changes are accounted for in computation of both actual and optimum conditions.

Key Words: Allowable cut, forest management, stand yield tables, timber management.

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INTRODUCTION

A forest operated as a business enterprise produces more than wood, forage, and other products. It is a prolific source of treatment and inventory records, reports, plans, maps, and other information. As with other businesses, there is great need for efficient information processing and retrieval so that all available information can be used for decisionmaking.

Procedures for analyzing inventory and other data and reducing them to summary values useful in planning, have been available for many years. These procedures have long provided information needed for management; their validity and usefulness usually have been widely accepted. There are, however, important deficiencies in the ways data have been handled and in the conventional methods of computation described in forest management texts. Specifically, the use of maps and overlays, timber atlas and similar records, and desk calculators involve such difficulties as the following:

1. There is usually more information available than can be stored, retrieved, and analyzed efficiently.
2. Maps, photographs, overlays, and tabulations of numerical data freeze the information at one or a few points in time. Changes in recorded information in response to changes in the forest are expensive and time consuming.
3. Higher offices may ask for information already assembled in whole or in part for a previous report, but for which the worksheets are no longer available. This can lead to much repetition in the assembly and analysis of data.
4. Information gathered for a specific purpose may be placed in a dead file after immediate needs are met. It may, however, have future value in management and decisionmaking, if it could be stored and relocated efficiently.
5. Timber management appears to proceed by steps, from management plan to management plan. Standing timber can and should be accounted for continuously, however, as is done for products entering and leaving a warehouse. There is danger of forgetting that a productive forest is a continuous, dynamic system.

High-speed computers with large memory capacity (both core and peripheral) provide a means of extracting efficiently large amounts of information from an accumulation of records. Data can be stored, retrieved, and updated with relative ease. Computations, if preplanned, can be done so cheaply that higher offices can obtain all the reports desired without disrupting the work schedule of local managers. There is no need to depend on plans that are expected to apply for several years despite fires, epidemics, and changes in economic conditions. A new plan, new maps, new cutting budget, and a new work schedule can be obtained as soon as recent changes in forest conditions can be recorded in the data file.

Program TEVAP (Timber, EValuation And Planning), described below and listed in Appendixes 1 and 3, provides a means of obtaining guidance quickly from a large volume of information. It is an example of the application of some information handling and analysis procedures to forest management. The program was developed around relationships that apply to timber production in even-aged stands because such relationships were available. It can, however, be expanded to include forage and other products and timber production in many-aged stands without change in the basic system.

Program TEVAP also provides an example of how a manager can obtain a management plan whenever he wants one. A computer run, using updated records, could be made each winter during the planning period between field or growing seasons. Large amounts of tedious computations and analyses are mechanized; management plans thus need not

be prepared only at intervals of perhaps 10 years. The term management plan refers to the quantitative section of a conventional timber management plan. This material, in the form produced by TEVAP, will hereafter be referred to as a management guide. Such information, regardless of how computed, is better considered as a guide or aid to management rather than as a plan. Following common modern practice, the transportation system and other general details can best be described in a report that covers the entire forest and all resources.

Programs such as TEVAP produce information that can be used for more purposes than control of current operations. They provide input data for programs that simulate operation of a forest under actual conditions. A manager can use the results of simulation to determine which one of several management alternatives will best meet his objectives (Chorafas 1965).

The program was written in USASI standard Fortran IV and tested on a CDC 6400[2] computer. Program organization permits modification for application to local tree species, procedures, and computing equipment. Improved or additional data and procedures can be inserted as they become available. Relationships that are specific to a species or location are described in Appendix 4. They can be replaced by statements applicable to other species or forest regions.

DATA HANDLING AND MANAGEMENT

Forest resource records are assembled from several sources. For timber, these sources are: (1) periodic forest inventory, (2) job reports prepared at the completion of each thinning, planting, sale, or other cultural operation, (3) area descriptions written after each fire or other catastrophe, and (4) stand and compartment analyses made as funds become available. Results of periodic inventories appear in management plans prepared after each inventory. Job reports and other data may be posted on the maps and tables of a timber atlas and summarized in annual reports. Although procedures vary among forest regions and classes of ownership, almost every item of information is used at some step in management and decision-making. Several operational computer programs for the analysis of periodic inventories illustrate how well the development of computation procedures has progressed.

It is unusual, however, for every item of information to be used for all appropriate purposes. For example, an individual fire report becomes part of the annual report on losses and suppression costs. It may then go to the protection file rather than be processed as an important item of inventory data.

There are valid reasons why the maximum amount of information may not be extracted from each item of data. Problems related to storage and retrieval are frequently of great importance. These include the size of record files, problems of assembling the data for use, and reassignment of people who know what has been recorded and where to find it. A forest manager is faced with other information problems that are less easily solved. There is little value in pooling records unless they can be updated to put them on a common time base. Also, data sufficient for a particular purpose may not be complete enough for more general use. A report on a thinning job may not contain sufficient stand or site data to permit its use in growth projections.

Procedures used in TEVAP to bypass some of the problems mentioned above are based on availability of a file of inventory records that can be updated as needed. This file contains stand data from many sources such as land books, job reports, and inventories. Stand descriptions prepared soon after thinning, fire suppression, and other activities provide excellent up-to-date inventory data and are used as such. Conventional inventories sample parts of a forest not already described in other records.

Inventory records for TEVAP, card type 16 in the list of data cards, are summaries of work reports or of conventional inventory records. They contain only the specific items needed for program execution. Overstory and understory components of a stand are described separately, if both are present. Computations can thus be made for stands being regenerated by shelterwood or seed tree systems. Growth can also be estimated for the many unevenaged stands that may be described mathematically as two stands, overstory and understory.

Data used by TEVAP can be updated by computer once the basic relationships needed have been determined. How this may be done for the inventory records is explained in Appendix 5.

[2] *Trade names and company names are used for the benefit of the reader, and do not imply endorsement or preferential treatment by the U. S. Department of Agriculture.*

DESCRIPTION OF PROGRAM TEVAP

Program TEVAP consists of a main program and nine subroutine subprograms (Appendix 1, Appendix 3). Three subroutines (MAPS, AREA1, AREA2) provide alternative ways of computing areas, and only one of them is used at a time. Program execution thus requires use of the main program and seven subroutines.

Content and purpose of each routine are described in the sections that follow. Variable names are defined with the main program in Appendix 1 and in the list of contents of the data deck. The list of data cards also reports the number of cards needed and the sequence in which they are read. An example of an application of TEVAP, reported in Appendix 2, provides additional explanation of the program.

The number of possible units of each kind of forest subdivision is limited by the dimensions assigned appropriate variables in COMMON and DIMENSION statements. Each subdivision has a different limit so dimensions and loops that pertain to it can be identified. Restrictions to be observed unless appropriate changes are made are as follows:

1. The working circle may be subdivided into one to five blocks. A block may be an isolated unit of the working circle or one or more ranger districts. There must be at least one block in the working circle for proper program execution.
2. A maximum of three working groups may be defined without changes in dimensions. For brevity, formats of output tables provide for only two working groups. A working group consists of stands of the same forest type and managed under the same silvicultural system (Chapman 1950).
3. Provision is made for 20 vegetative or use types; 17 types are used for the example presented in Appendix 2. They are as follows:

   Types 1-5 - Five broad age classes within a pine working group that is regenerated by shelterwood.

   Types 6-10 - Five broad age classes within a spruce working group that is regenerated by small clearcuts.

   Type 11 - Deforested areas covered by brush.

   Type 12 - Deforested areas covered by grass.

   Type 13 - Recreation areas not included in computations of allowable cut.

   Type 14 - Rock outcrops and other areas where plant products cannot be produced.

   Type 15 - Areas covered by brush that will not be converted to forest.

   Type 16 - Areas with grasses and other herbaceous species that will be managed for forage production.

   Type 17 - Areas of other ownership within the boundaries of the working circle.
4. Stand ages may be grouped into 15 or fewer 10-year age classes. This classification is in addition to, but correlated with, the use of age in the forest type definitions.
5. Provision is made for up to 30 subcompartments per compartment. This specification need be considered only if subroutine MAPS is chosen as the source of area data.

Main Program

The main program calls five subroutines to execute five groups of operations in the following order:

1. Read values of control variables.
2. Compute area totals and subtotals.
3. Compute present and future volumes, periodic yields, and other descriptive values.
4. Compute optimum growing stocks and yields.
5. Summarize computations and print a guide to management.

TEVAP provides three alternatives for the second set of operations, computation of areas. One alternative (MAPS) requires complete forest subdivision plus compartment maps on punched cards or magnetic tape. Another (AREA2) requires only a knowledge of total area of the working circle and of each nontimber vegetative or use type. The third alternative (AREA1) represents one intermediate possibility, knowledge of type areas by compartments but with subcompartments not designated or mapped. A new routine may replace the three examples if still another level of information is of interest.

Each subroutine called by the main program writes one or more pages. Each page is identified by a type number such as "page type 3." Each type number, except type 5, designates a specific page layout. Pages are not numbered consecutively because page requirements will vary with size of the working circle and area alternative used. The last three items printed are designated types 1, 2, and 3 since many managers prefer that summary pages be the initial pages of a plan. Pages of

Z-fold paper can be separated and placed in proper numerical order. Temporary storage on scratch tapes can be used to reorder pages for output onto film.

Subroutine BASIS

BASIS enters into computer memory values of control variables that do not change during program execution. Some variables quantify management decisions and economic limitations. These include frequency and intensity of thinning, rotation lengths, volume of seed trees or shelterwood, and minimum volumes for commercial operations. Other variables define such items as expected growth of an overstory seed source and length of the delay between regeneration cutting and establishment of the new stand. Values of the control variables can be obtained from analysis of past records, measurements on temporary plots, and from computer simulations based on goals and policy (Myers 1968).

Values read by BASIS are printed as page type 4 to provide a record of the control variables. These variables are listed and defined in the description of the data deck.

Subroutine MAPS

Subroutine MAPS is one of three alternative routines used to compute areas. Complete forest subdivision to the subcompartment and compartment maps that show types and subcompartments are needed. The sequence of operations is explained by COMMENT statements in the program listing (Appendix 3).

Program MAPS accepts map data in the form of arrays of map codes on punch cards or tape. The form of input is specified by assignment of logical unit 3 to the card reader or to a tape drive. Array sizes, related DIMENSION statements, the system of map codes, and the area represented by one square of the map grid may be changed as desired.

Coding of types (KTYP) and subcompartments (KSUB) followed a procedure used for demographic and other studies. In the example, each section of 640 acres on a forest stand map was subdivided into 144 small squares. Each square of 4.444 acres (map 4 inches to 1 mile) was then assigned the code number of the predominant type. Portions of sections were combined to reproduce the entire compartment. Subcompartments were then designated and coded on the basis of type codes and field data. In the forest used as an example, all compartments fit into squares three sections on a side and could be represented by arrays of 36x36 2-digit code numbers. One west-to-east row of coding occupied the first 72 columns of a punch card. As many cards as necessary, but not more than 36, were punched to complete a type or subcompartment map for a compartment. All cards were run through an editing program to locate errors. This included a check that each subcompartment contained only one type. Corrected maps and control variables were then recorded on magnetic tape, using WRITE statements equivalent to the last three READ statements of MAPS.

The mapping procedure used is intended to illustrate the types of information needed and what can be done with it. In actual applications, more efficient procedures may be available. Hand-coding, for example, can be replaced by use of equipment that reduces map areas to digitized form. Forest managers can obtain procedural guides from the many applications of computer graphics to studies of urban problems and land use (Shahar 1970).

MAPS contains the one machine-dependent operation in program TEVAP. Map code numerals are converted to display code so blank areas of the maps will not be filled with minus zeros. Converted numbers are then printed with R format. Program statements must be modified if available equipment uses a different display code than the CDC 6400 used to test the program.

Two pages, types 5 and 6, are printed by MAPS. The form of page type 5 is optional, and is specified by the value read initially for the variable MAP (Appendix 3). Type and subcompartment maps and related area totals may be printed, if desired. Two pages are produced per compartment, one with the type map and one with the subcompartment map. Alternatively, only type and subcompartment areas may be printed (MAP = 0). Page type 6 reports block and working circle totals, and has the same format as the equivalent page produced by AREA1 and AREA2 (Appendix 2).

Following usual rules for forest subdivision, type and subcompartment boundaries are continually subject to change (Chapman 1950). The map file must therefore be updated prior to each computer run with subroutine MAPS. Cultural operations, growth into the next age class, and fire or other catastrophe create need for recoding.

Subroutine AREA1

Subroutine AREA1 is another of the three alternative routines that compute areas. It is used if compartments have been established and if type areas within compartments are known. It is assumed that either subcompartments have not been established, or that compartment maps are not available. AREA1 illustrates one possible situation in the range of degrees of administrative complexity between the limits served by MAPS and AREA2.

Type areas by compartment—inputs to the subroutine—are summed to obtain total acres by working group, by block, and by various other classifications and combinations thereof. These sums are passed through COMMON to GOT. COMMENT statements in the program listing, Appendix 3, explain the operations involved.

AREA1 prints type areas of each compartment on one form of type 5 pages (Appendix 3) and prints a type 6 page to report block, working group, and working circle totals. The type 6 page is the same as that produced by MAPS and AREA2.

Subroutine AREA2

Subroutine AREA2 is the third of the routines used to compute areas (Appendix 1). It is used if compartments have not been established, or if type areas within compartments are not known. This is the situation assumed for the example in Appendix 2. Type areas are computed from total production area, including nonstocked, and inventory information on type 16 data cards. Areas of nonforest types and of unregulated stands in recreation areas are subtracted from working circle area to get the area available for timber management. Stands of known area are assigned to the appropriate type. Remainder of the production area is allocated to forest types in proportion to the number of inventory records from each type. These inventory records are the same records used by subroutine GOT.

Type, working group, and block areas are recorded on pages type 5 and 6 (Appendix 2).

Subroutine GOT

Subroutine GOT processes the set of inventory records (data card type 16) to obtain present and future volumes and other values. Controls described in the following paragraphs apply to all computations.

Inventory records have a number in the ACRE field if the tree and site index values are amounts per acre averaged over a specific stand. The ACRE field has a blank or zero if the record is for a sample plot that describes a portion of the "unknown" forest area. In terms of recent National Forest inventories, the working circle may be at stage one (sampling the working circle), at stage two (compartment analysis), or with parts of the area at each level.

Records are counted by several classifications if the ACRE field is blank or has zeros. Nonzero values of ACRE are added to appropriate area totals and are subtracted from a duplicate array of the type areas computed by MAPS, AREA1, or AREA2. Type areas remaining in the duplicate array after all records are processed are assigned to age and site index classes in proportion to the number of zero-area records in each class.

Volume computations are bypassed for records from: (1) deforested areas, (2) areas below minimum site index for management, (3) trees too young or too small to have more than a few merchantable cubic feet per acre, and (4) stands below minimum age for inclusion in growing stock totals. With these exceptions, operations performed on individual inventory records produce the following values:

1. Present basal areas and volumes per acre.
2. Basal areas and volumes at the end of the planning period.
3. Growth expected during the next planning period, in cubic feet and board feet. Thinnings are computed as though done at the beginning and end of the period, and average growth is determined. It is assumed that about equal areas will be thinned each year of the period.
4. Potential yields during the next planning period if all areas are treated as specified by WORK on the inventory records. Half the potential growth of stands to be cut during the period is added to potential yields. Volumes are not included in total yields if they are less than the minimum commercial cuts specified by values of variables COMBF(I) and COMCU.

Two variables define time periods. TIME is the number of years in a planning period. It is the period considered in assigning the WORK index that identifies stands in need of treatment in the

near future. Possible values of WORK are defined in Appendix 1. RINT is the number of years for which the equations predict future d.b.h., height, and stand density. TIME must be equal to or a multiple of RINT.

Two sets of volume totals are maintained for block, age, and other subdivisions until all inventory records are processed. One set reports volumes of stands of known area. Volumes per acre are multiplied by area to obtain stand volumes for addition to the totals. The second set reports volumes from records with no entry for area in the ACRE field. Volumes per acre are summed for each subdivision specified in the program. These sums are converted to totals for each subdivision after all records have been processed and the area represented by one sample plot determined.

Summaries of area and present volumes are printed on pages type 7, 8, and 9. Working circle totals are subdivided among block, type, and site index classes. Many computed values are not reported at this point in the program, but are retained in COMMON for use by GOAL and GUIDE.

Inventory records used by AREA2 and GOT could be listed according to value of the WORK variable. This would provide information on where stands to be treated during the next management period are located. Such a list is not made by TEVAP, but could be produced by a separate run of the inventory records.

Subroutine GOAL

Subroutine GOAL computes the optimum conditions that would exist if all stands were thinned on schedule to the specified level, and if a balanced series of age classes had been established. Values needed to make these computations come from other routines. Management decisions based on experience, results of simulations, and statements of policy are entered by BASIS. Acres in each site index class of each working group are computed by GOT from area data and the inventory file.

Most computations are executed once for each site index class of each working group. Major operations, in the order performed for a site class, are as follows:

1. A yield table that incorporates management decisions such as frequency and intensity of thinning is printed as page type 10. Prediction equations used are described in Appendix 4. Thinnings and conversion of cubic feet to other units are simulated by subroutines CUTS and VOLS, described below. A yield table for a site class of a working group serves as a "normal" or standard for stands of that classification. It represents the goal toward which operations are directed. It is possible to produce many yield tables for a site class, which emphasizes that there cannot be a single table for managed stands of a species and site class. The term "managed" indicates that there are additional variables to be considered; one table cannot account for all the possibilities. Each table is useful only where goals and management decisions are as specified for its computation.

   Details of field work and computations needed to produce yield tables have been published elsewhere (Myers 1966, Myers and Godsey 1968). Much of GOAL from statement 45 to statement 184 is a duplication of procedures developed for yield table construction. Recent changes and generalizations are described in Appendix 4.
2. Volumes per acre at each year of stand age are obtained by interpolation between yield table values. These volumes, in board feet and cubic feet, are later summed to obtain optimum growing stocks. Results of the interpolations are printed as page type 11 to preserve them for possible use after the management guide has been produced.
3. Mean annual increment at rotation age is computed for each site class of each working group. If appropriate, tree felling ages do not equal rotation ages, but include the effects of delays in obtaining regeneration and the period seed trees or a shelterwood may be left over the new crop. Mean annual increments computed from yield table volumes are later used as "normal" increments in application of Heyer's formula:

$$E = WZ + \frac{WV - NV}{a}$$

   where: WZ is mean annual increment, WV is actual growing stock, NV is normal growing stock, and a is the adjustment period (Burger 1920).
4. GOAL calculates the number of acres and the growing stock in each age class with a balanced series of age classes. Area regulation is assumed for these computations; ANCUT(I,J) is area divided by rotation age. Acres with stands of zero age

are listed as such if delays in regeneration are expected with clearcut systems. Volumes of seed trees or shelterwood are included in age class totals if these silvicultural systems are used. Overwood volumes appear in the age class of the overwood trees during periods of delay in regeneration. Overwood volumes are in the youngest age classes after the new crop appears and before the overwood is removed. Tables on pages type 12 of Appendix 2 show examples of working groups managed by shelterwood and clearcut systems.

5. Annual cuts that might be obtained with a balanced series of age classes and optimum stand density are computed for each working group. Volumes from intermediate, regeneration, and final cuts are not combined into working group totals until GUIDE is called.

Subroutine GUIDE

Subroutine GUIDE computes several variables used in regulation of the cut, and prints three types of summary pages. Differences between actual and optimum growing stocks are computed and printed as part of page type 2. Acres and the volumes that could be obtained by thinning, regeneration cutting, and other operations during the next management period are summarized. Summary values, by block and type, are printed as page type 3. Separate pages of types 2 and 3 are printed for each working group.

Page type 1 contains a summary of computations made by the entire program, including a statement of the allowable cuts computed by GUIDE. As programed, page type 1 contains only a few of the items that could be assembled on summary pages. It is an example of what can be done, not an attempt to provide a standardized format.

TEVAP computes and reports three annual cuts, as examples of what can be done by this or similar programs. The types of cut are:

1. Idealized cut based on area regulation and a balanced series of age classes. Components of this cut are computed by GOAL and summarized by GUIDE.
2. Potential cut if all operations called for by the WORK index were performed, without regard to other restrictions. Periodic cuts are computed by GOT and converted to annual volumes by GUIDE.
3. Annual cut computed with a modification of Heyer's formula and an adjustment period of ADJ(I) years. Growing stock volumes computed from mean annual increment, as called for by the formula (Burger 1920), are not used. Instead, actual and desired growing stocks computed by GOT and GOAL are used by GUIDE to compute the desired values. Initial term of the formula is mean annual increment obtained from the idealized yield tables produced by GOAL.

Convenient comparisons of annual cuts provided by page type 1 suggest another use of programs such as TEVAP. They can be used as tools for research on the principles of allowable cut determination. For example, quite dissimilar results would be produced by various modifications of the Heyer formula. Periodic annual increments, PAIBD(I) and PAICU(I), are computed by GOT for use in such comparisons. Predominance of young stands in the forest described in Appendix 2 suggests that a relatively low annual cut, one computed from mean annual increment, be accepted as a guide to management (Dwight 1965).

Subroutine VOLS

VOLS is called by GOT and GOAL to convert total cubic feet per acre to other units. As listed in Appendix 1 and described in Appendix 4, conversions can be made to cubic feet to a 4-inch top and to board feet Scribner Rule. Other conversions could be added, such as those based on tree contents in square feet of veneer or in pounds of wood (Myers 1960).

Conversion factors (FCTR and PROD) are computed from average stand diameter, and are passed through COMMON to the calling routine. They are computed for one species and for one or two stand conditions at a time. Stand conditions may be present and future stand, overstory and understory, or similar paired requirements. Calls of the subroutine by GOAL require that only one value of each conversion factor be computed for each CALL statement. Each CALL VOLS is preceded by specification of the number of values of each factor needed and by the average diameter to be used. Minimum average diameters are specified for each factor; variability is so great with small diameters that the results serve no useful purpose.

Subroutine CUTS

Subroutine CUTS estimates average stand diameter after thinning from below. Estimated diameter after thinning (DBHE) is computed from diameter before thinning and the percentage of trees to be retained (Appendix 4). Successive percentages are tested until d.b.h. after thinning, number of trees retained, and residual basal area agree with the growing stock goal specified by THIN(I) or DLEV(I). Each call by GOT or GOAL is preceded by a statement that specifies the thinning level (REST) to be used.

Growing stock levels specify the basal area to be left after thinning in relation to average stand diameter (Appendix 4). Definition of several levels provides for alternative thinning intensities. Each level is named by the basal area to be left when average diameter is 10.0 inches or larger. Residual basal area increases with stand diameter until the diameter reaches 10.0 inches. Thereafter, basal area remains constant for any one stocking level. Subroutine CUTS therefore has two iterative loops so a full range of diameters, with both variable and constant basal area, may be accommodated. Limiting d.b.h. for selection of loops is 10.0 inches minus the smallest change expected from usual thinning practice.

DATA DECK FOR TEVAP

Nineteen types of punch cards or card images, listed below, are used to enter initial values of variables into computer memory. In this section, the word "card" may refer either to a standard 80-column punch card or to a card image on magnetic tape. Records that can best be handled by tape are identified in the descriptions of the subroutines.

In the following list, type numbers with asterisks designate alternatives (types 8 to 15, inclusive). Only two to four of these types need appear in the data deck for a single run of the program. Basis for choice is the area subroutine (MAPS, AREA1, AREA2) selected for call by the main program. All cards with type numbers not followed by asterisks must be included in the data deck so READ statements will be executed properly. Data cards are read in order of type numbers except for choice among types 8 to 15, and repetition needed because of number of working groups and other forest subdivisions.

Card types 1 to 7, inclusive, are read by BASIS. Types 1, 3, 4, and 7 consist of one card each; type 2 consists of three cards. One card of type 5 and one card of type 6 must be provided for each working group. Cards are read in order of type number, with cards of type 5 completed before type 6 is started; type 6 is completed before type 7 is read.

Subroutine MAPS, if used, reads card types 8 to 11, inclusive. One card of type 8 is needed to enter values that apply to all compartments. A set of cards for one compartment consists of type 9 (one card), type 10 (up to 36 cards), and type 11 (up to 36 cards). These sets are read in the sequence 9, 10, 11, 9, 10, 11, etc. until the number of sets or compartments (NCMP) on card type 3 has been processed.

AREA1, if used, reads card types 12 and 13. A set of cards for one compartment consists of one card of type 12 and the two cards that make up type 13. Sets are read in the sequence 12, 13, 12, 13, etc. until the number of sets or compartments (NCMP) on card type 3 has been processed.

Subroutine AREA2, if used, reads card types 14 to 17 inclusive. First, one card of type 14 with one to five block areas is read. One card of type 15 is then read for each entry on card type 14. Cards of type 15 must be arranged in the order block 1, block 2, and so forth, up to the highest block number needed, to match the order in which block areas are punched on card type 14. All cards or card images of type 16 are read after reading of card type 15 is completed. This reading of type 16 is a preliminary count, and does not substitute in any way for the reading of the same data by subroutine GOT. Reading is terminated by a card of type 17 with a zero or very large value for IBK.

GOT reads card types 16 and 17. The number of cards or card images of type 16 is determined by the number of inventory plots measured and/or by the number of subcompartments for which inventory data are known. To avoid counting of inventory records prior to program execution, a record (type 17) with a zero or very large value for block number follows the type 16 records. This terminates processing of the inventory and moves control to another place in the program. Fields for KOMP, ISUB, and ACRE on an inventory record will be blank when complete forest subdivision does not exist or is not used for the record.

Remaining cards in the data deck, types 18 and 19, are read by subroutine GOAL. The sequence is: (1) all type 18 cards for the first working group, (2) a type 19 card, (3) all type 18 cards for the second working group, and (4) another type 19 card, etc., until NWGP working groups have been processed. Zero or very large values for AGEO (type 19) terminate each set of type 18, so preliminary knowledge of the number of site classes inventoried is not necessary.

Card type	Read by	No. of cards	Variable name	Columns	Format	Description of variable
1	BASIS	1	FORET(I)	1-24	3A8	Name of the forest or working circle.
2	BASIS	3	TYPNM(I)	1-80	8A10	Brief name for each vegetative or use type.
3	BASIS	1	NBK	1-4	I4	Number of blocks in working circle. Must be at least one.
			NCMP	5-8	I4	Number of compartments in working circle. Leave blank for AREA2.
			NWGP	9-12	I4	Number of working groups in working circle.
			MIN	13-16	I4	Minimum age for inclusion of stand volume in growing stock.
4	BASIS	1	ROTA	1-8	F8.3	Longest possible rotation to be shown in yield tables.
			CYCL	9-16	F8.3	Years between intermediate cuts.
			RINT	17-24	F8.3	Number of years for which the equations predict growth.
			COMCU	25-32	F8.3	Minimum commercial cut per acre, hundreds of cu. ft.
			BFMRCH	33-40	F8.3	Minimum M bd. ft. per acre for inclusion in growing stock.
			TIME	41-48	F8.3	Number of years in planning period.
5	BASIS	1 per working group	GROWB(I)	1-5	F5.3	Growth rate in percent of bd. ft. in shelterwood, working group I.
			GROWC(I)	6-10	F5.3	Growth rate in percent of cu. ft. in shelterwood, working group I.
			FINL(I)	11-14	F4.1	Years between regeneration cut and final removal of shelterwood, working group I.

Card type	Read by	No. of cards	Variable name	Columns	Format	Description of variable
			DLEV(I)	15-18	F4.1	Growing stock level for cuts after initial thinning, working group I.
			THIN(I)	19-22	F4.1	Growing stock level for initial thinning, working group I.
			POOR(I)	23-26	F4.1	Minimum site index to be managed for timber, working group I.
			SHELT(I)	27-30	F4.1	M bd. ft. to be left as shelterwood, working group I.
			SHWD(I)	31-34	F4.1	Hundreds of cu. ft. to be left as shelterwood, working group I.
			COMBF(I)	35-38	F4.1	Minimum commercial cut in M bd. ft. per acre, working group I.
			DELAY(I)	39-42	F4.1	Years between regeneration cut and regeneration, working group I.
			ADJ(I)	43-46	F4.1	Length of period of adjustment in allowable cut formula, working group I.
6	BASIS	1 per working group	RAGE(I,J)	1-40	10F4.0	Rotation selected for working group I and site index class J.
7	BASIS	1	DATE(I)	1-24	3A8	Date of most recent changes in data files.
8 *	MAPS	1	MAP	1-4	I4	Index to print (1) or to omit (0) compartment maps.
			SCALE	5-10	F6.4	Acres represented by one code number on a compartment map.
9 *	MAPS	1 per comp.	KBK	1-4	I4	Block in which the compartment is located.
			KOMP	5-8	I4	Number of the compartment being processed.
			NROW	9-12	I4	Number of rows of map symbols in the compartment map.

Card type	Read by	No. of cards	Variable name	Columns	Format	Description of variable
10 *	MAPS	NROW per comp.	KTYP(I,J)	1-72	36I2	Type numbers in compartment type map.
11 *	MAPS	NROW per comp.	KSUB(I,J)	1-72	36I2	Subcompartment numbers in map of subcompartments.
12 *	AREA1	1 per comp.	KBK	1-4	I4	Block in which the compartment is located.
			KOMP	5-8	I4	Number of the compartment being processed.
13 *	AREA1	2 per comp.	ARETY(I)	1-80	10F8.1	Acres of type I in the compartment being processed.
14 *	AREA2	1	ARBK(I)	1-40	5F8.1	Acres in block I.
15 *	AREA2	1 per block	SARETY(I,J)	1-64	8F8.1	Acres of nontimber type J in block I.
16	AREA2 GOT	1 per plot or subcomp.	IBK	1-2	I2	Block number. Must be at least 1 block in working circle.
			KOMP	3-6	I4	Compartment number. Enter only if applicable.
			ISUB	7-9	I3	Subcompartment number. Enter only if applicable.
			QTR1	10-12	A3	Location in ¼ ¼ of public land survey. Replace columns 10-26 with other location data, where appropriate.
			QTR2	13-15	A3	Location in ¼ section of public land survey.
			SECT	16-18	A3	Section in which inventory plot or largest part of compartment is located.
			TOWN	19-22	A4	Township location of the section.
			RANG	23-26	A4	Range location of the section.
			SITE	27-30	F4.0	Average site index of the plot or subcompartment.
			STRY	31-32	F2.0	Indicates whether type is based on overstory (blank) or on understory (1).

Card type	Read by	No. of cards	Variable name	Columns	Format	Description of variable
			NTYP	33-35	I3	Vegetative or use type of the plot or subcompartment.
			WORK	36-38	F3.0	Code number of treatment needed during planning period.
			DBH(1)	39-42	F4.1	Average d.b.h. of the overstory trees.
			HT(1)	43-45	F3.0	Average height of dominant and codominant overstory trees.
			DEN(1)	46-50	F5.0	Number of overstory trees per acre.
			AGE(1)	51-54	F4.0	Average age of overstory trees.
			DBH(2)	55-58	F4.1	Average d.b.h. of the understory trees.
			HT(2)	59-61	F3.0	Average height of potential dominants and codominants in the understory.
			DEN(2)	62-66	F5.0	Number of understory trees per acre.
			AGE(2)	67-70	F4.0	Average age of understory trees.
			ACRE	71-75	F5.1	Area of the subcompartment described. Leave blank if data refer to plot, not stand, data.
			WHEN	76-80	F5.0	Year of first growing season after inventory was made.
17	AREA2 GOT	1	(Very large or zero value of IBK in first 2 columns to stop reading of type 16 records.)			
18	GOAL	1 per site class in a working group	AGEO	1-5	F5.1	Initial age in yield table for the site class.
			DENO	6-10	F5.1	Number of trees per acre expected before thinning at age AGEO.
			DBHO	11-15	F5.1	Average stand d.b.h. at age AGEO with density DENO.
19	GOAL	1 per working group	(First 5 columns blank or with number larger than ROTA to clear cards of type 18.)			

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APPENDIX 1

Listing of Program TEVAP

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      PROGRAM TEVAP
     1(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE4=TAPE5,TAPE3=TAPE5)
C
C DEFINITIONS OF VARIABLES.
C
C      ABFAG(I,J) = ACTUAL GROWING STOCK IN M BD. FT. FOR WORKING GROUP I
C           AND AGE CLASS J.
C      ACBAR(I) = DEFORESTED ACRES IN BLOCK I.
C      ACFNL(I,J,K) = ACRES TO RECEIVE FINAL CUT DURING NEXT PERIOD -
C           WORKING GROUP I, BLOCK J, AGE CLASS K.
C      ACINT(I) = ACRES RECEIVING INTERMEDIATE CUT ANNUALLY IN BALANCED
C           FOREST, WORKING GROUP I.
C      ACRE = AREA OF THE STAND DESCRIBED BY THE INVENTORY RECORD, IF
C           KNOWN. BLANK INDICATES RECORD APPLIES TO SAMPLE PLOT.
C      ACRGN(I,J,K) = ACRES TO RECEIVE REGENERATION CUT DURING NEXT
C           PERIOD - WORKING GROUP I, BLOCK J, AGE CLASS K.
C      ACSI(I,J,K) = ACRES OF WORKING GROUP I, BLOCK J, SITE CLASS K.
C      ACSP(I,J) = ACRES OF WORKING GROUP I IN BLOCK J.
C      ADJ(I) = YEARS IN ADJUSTMENT PERIOD, WORKING GROUP I.
C      AGE(I) = AVERAGE AGE OF OVERSTORY(I=1) OR UNDERSTORY(I=2).
C      AGED = INITIAL AGE IN YIELD TABLE.
C      ALLCF(I,J) = GROWING STOCK GOAL FOR WORKING GROUP I, SITE CLASS J.
C           CUBIC FEET OF ENTIRE STANDS TO ROTATION AGE.
C      ALOWC(I) = ALLOWABLE ANNUAL CUT IN HUNDREDS OF CU. FT., BASED ON
C           ACTUAL AND DESIRED GROWING STOCKS OF WORKING GROUP I.
C      ALWBF(I) = ALLOWABLE ANNUAL CUT IN M BD. FT., BASED ON ACTUAL AND
C           DESIRED GROWING STOCKS OF WORKING GROUP I.
C      AMCAG(I,J) = ACTUAL GROWING STOCK IN HUNDREDS OF CU. FT. FOR
C           WORKING GROUP I AND AGE CLASS J.
C      ANBDF(I) = M BD. FT. PER ACRE AT END OF EACH YEAR.
C      ANCUT(I,J) = AREA / ROTATION FOR WORKING GROUP I, SITE CLASS J.
C      ANCUV(I) = CU. FT. STANDING PER ACRE AT END OF EACH YEAR.
C      ANNAC = TOTAL ACRES TO BE TREATED ANNUALLY DURING NEXT PERIOD.
C      ANNBD = EXPECTED TOTAL ANNUAL YIELD DURING NEXT PERIOD IN M BD. FT.
C      ANNCU = EXPECTED TOTAL ANNUAL YIELD DURING NEXT PERIOD IN CU. FT.
C      ARBK(I) = AREA OF BLOCK I.
C      AREA(I,J) = AREA OF SITE CLASS J OCCUPIED BY WORKING GROUP I.
C           INCLUDES SHARE OF DEFORESTED AREA.
C      ARECP = TOTAL AREA OF COMPARTMENT.
C      ARESC(I) = ACRES IN SUBCOMPARTMENT I.
C      ARETY(I) = ACRES OF TYPE I IN ONE COMPARTMENT.
C      BARE = DEFORESTED ACRES IN A COMPARTMENT.
C      BARSI(I,J) = DEFORESTED ACRES OF SITE J IN BLOCK I.
C      BAS(I) = BASAL AREA OF OVERSTORY(I=1) OR UNDERSTORY(I=2).
C      BASC = BASAL AREA REMOVED PER ACRE.
C      BASD = BASAL AREA PER ACRE BEFORE THINNING.
C      BAST = BASAL AREA PER ACRE AFTER THINNING.
C      BCAI = M.A.I. IN M BD. FT. FROM YIELD TABLE.
C      BDFC(I) = M BD. FT. REMOVED PER ACRE.
C      BDFO(I) = M BD. FT. PER ACRE BEFORE THINNING.
C      BDFT(I) = M BD. FT. PER ACRE AFTER THINNING.
C      BDMAI(I) = M.A.I. IN M BD. FT. FROM YIELD TABLE AND ACRES IN SITE
C           CLASS, WORKING GROUP I.
C      BFAGE(I,J) = GROWING STOCK GOAL IN M BD. FT. FOR WORKING GROUP I
C           AND AGE CLASS J.
C      BFBLK(I) = M BD. FT. IN BLOCK I.
C      BFINT(I) = M BD. FT. FROM INTERMEDIATE CUTS ANNUALLY IN BALANCED
C           FOREST, WORKING GROUP I.
C      BFM(I) = M BD. FT. IN OVERSTORY(I=1) OR IN UNDERSTORY(I=2).
C      BFMRCH = MINIMUM VOLUME TO BE INCLUDED IN BD. FT. GROWING STOCK.
C      BFS(I) = GROWING STOCK GOAL BY AGE CLASS I FOR ONE SITE CLASS OF
C           WORKING CIRCLE, M BD. FT.
C      BFSP(I,J) = M BD. FT. OF WORKING GROUP I IN BLOCK J.
C      BFTB(I,J) = M BD. FT. IN TYPE J OF BLOCK I.
C      BFTH(I,J) = CURRENT POTENTIAL PERIODIC YIELD FROM THINNINGS IN
C           BLOCK I AND TYPE J, M BD. FT.
C      BFVOL = M BD. FT. PER ACRE MINUS VOLUME LEFT AS SEED SOURCE.
C      CFAGE(I,J) = GROWING STOCK GOAL IN MERCHANTABLE CUBIC FEET FOR
C           WORKING GROUP I AND AGE CLASS J.
C      CFAI = M.A.I. IN HUNDREDS OF CU. FT. FROM YIELD TABLE.
C      CFBF(I,J) = GROWING STOCK GOAL FOR WORKING GROUP I, SITE CLASS J.
C           CUBIC FEET IN SAWLOG TREES.
C      CFMC(I) = MERCHANTABLE CU. FT. REMOVED PER ACRE.
C      CFMER(I) = MERCH. CU. FT. IN BLOCK I, IN HUNDREDS.
C      CFMD(I) = MERCHANTABLE CU. FT. PER ACRE BEFORE THINNING.
C      CFMT(I) = MERCHANTABLE CU. FT. PER ACRE AFTER THINNING.
C      CFTB(I,J) = TOTAL CU. FT. IN TYPE J OF BLOCK I, IN HUNDREDS.
C      CFVOL = CU. FT. PER ACRE MINUS VOLUME LEFT AS SEED SOURCE.
C      CM(I) = HUNDREDS OF MERCH. CU. FT. IN OVERSTORY(I=1) OR IN
C           UNDERSTORY(I=2).
C      CMS(I) = GROWING STOCK GOAL BY AGE CLASS I FOR ONE SITE CLASS OF
C           WORKING CIRCLE, HUNDREDS OF CU. FT.
C      CMSP(I,J) = MERCH. CU. FT. OF WORKING GROUP I IN BLOCK J.
C      CMTB(I,J) = HUNDREDS OF MERCH. CU. FT. IN TYPE J OF BLOCK I.
C      CMTH(I,J) = CURRENT POTENTIAL PERIODIC YIELD FROM THINNINGS IN
C           BLOCK I AND TYPE J, HUNDREDS OF CUBIC FEET.
C      COMBF(I) = MINIMUM COMMERCIAL CUT OF WORKING GROUP I IN M BD. FT.
C      COMCU = MINIMUM COMMERCIAL CUT IN CU. FT.
C      CUINT(I) = CU. FT. FROM INTERMEDIATE CUTS ANNUALLY IN BALANCED
C           FOREST, WORKING GROUP I.
C      CUMAI(I) = M.A.I. IN HUNDREDS OF CU. FT. FROM YIELD TABLE AND ACRES
C           IN SITE CLASS, WORKING GROUP I.
C      CUTA(I,J) = POTENTIAL BD. FT. VOLUME, LESS SHELTERWOOD, AVAILABLE
C           FROM REGENERATION CUTS - BLOCK I, TIMBER TYPE J.
C      CUTB(I,J) = POTENTIAL BD. FT. VOLUME AVAILABLE FROM REMOVAL OF
C           OVERWOOD - BLOCK I, TIMBER TYPE J.
C      CVR(I) = NUMBER OF MAP SQUARES IN TYPE I.
C      CYCL = INTERVAL BETWEEN INTERMEDIATE CUTS.
C      DATE = DATE OF MOST RECENT CHANGES IN INVENTORY OR OTHER DATA.
C      DBH(I) = AVERAGE D.B.H. OF OVERSTORY(I=1) OR UNDERSTORY(I=2).
C      DBHD = AVERAGE STAND D.B.H. BEFORE THINNING.
C      DBHT = AVERAGE STAND D.B.H. AFTER THINNING.
C      DELAY(I) = YEARS DELAY BETWEEN REGENERATION CUT AND ESTABLISHMENT
C           OF NEW STAND, WORKING GROUP I.
C      DEN(I) = TREES PER ACRE IN OVERSTORY(I=1) OR UNDERSTORY(I=2).
C      DENC = TREES REMOVED PER ACRE.
C      DEND = TREES PER ACRE BEFORE THINNING.
C      DENT = TREES PER ACRE AFTER THINNING.
C      DFBF(I,J) = DIFFERENCE BETWEEN ACTUAL STOCK AND GOAL IN M BD. FT.
C           FOR WORKING GROUP I AND AGE CLASS J.
C      DFMC(I,J) = DIFFERENCE BETWEEN ACTUAL STOCK AND GOAL IN HUNDREDS
C           OF CU. FT. FOR WORKING GROUP I AND AGE CLASS J.
C      DLEV(I) = GROWING STOCK LEVEL FOR THINNINGS AFTER INITIAL CUT,
C           WORKING GROUP I.
C      EQIV(I) = ACRES PER STANDARD ACRE, SITE CLASS I - FROM BOARD FEET.
C      EQVCF(I) = ACRES PER STANDARD ACRE, SITE CLASS I - FROM CUBIC FEET.
C      FAC(I) = RATIO OF YIELD OF SITE CLASS I TO STANDARD YIELD, BOTH
C           IN BOARD FEET.
C      FACCF(I) = RATIO OF YIELD OF SITE CLASS I TO STANDARD YIELD, BOTH
C           IN CUBIC FEET.
C      FBA(I) = FUTURE BASAL AREA OF OVERSTORY (1) OR UNDERSTORY (2).
C      FBD(I) = FUTURE M BD. FT. IN OVERSTORY (1) OR UNDERSTORY (2).
C      FCTR(I) = MERCHANTABLE CU. FT. PER TOTAL CU. FT. - FACTOR.
C      FDM(I) = FUTURE AVERAGE D.B.H. OF OVERSTORY(1) OR UNDERSTORY (2).
C      FDN(I) = FUTURE TREES PER ACRE IN OVERSTORY(1) OR UNDERSTORY (2).
C      FHT(I) = FUTURE AVE. HEIGHT OF OVERSTORY (1) OR UNDERSTORY (2).
C      FINB(I) = EXPECTED ANNUAL YIELD IN M BD. FT. FROM FINAL CUTS
C           DURING NEXT PERIOD, WORKING GROUP I.
C      FINC(I) = EXPECTED ANNUAL YIELD IN CU. FT. FROM FINAL CUTS DURING
C           NEXT PERIOD, WORKING GROUP I.
C      FINL(I) = YEARS BETWEEN REPRODUCTION CUT AND REMOVAL OF OVERWOOD,
C           WORKING GROUP I. INCLUDES DELAY(I), IF ANY.
C      FMC(I) = FUTURE MERCH. CU. FT. IN OVERSTORY (1) OR UNDERSTORY(2).
C      FNAC(I) = EXPECTED ACRES TO RECEIVE FINAL CUTS ANNUALLY DURING
C           NEXT PERIOD, WORKING GROUP I.
C      FNBD(I) = ANNUAL YIELD FROM FINAL CUTS WITH BALANCED SERIES OF AGE
C           CLASSES, M BD. FT. OF WORKING GROUP I.
C      FNCU(I) = ANNUAL YIELD FROM FINAL CUTS WITH BALANCED SERIES OF AGE
C           CLASSES, CU. FT. OF WORKING GROUP I.
C      FORET(I) = NAME OF FOREST OR WORKING CIRCLE.
C      FVL(I) = FUTURE TOTAL VOLUME OF OVERSTORY(1) OR UNDERSTORY (2).
C      GRBD(I,J,K) = PERIODIC GROWTH OF WORKING GROUP I, BLOCK J, AND AGE
C           CLASS K IN M BD. FT.
C      GRMC(I,J,K) = PERIODIC GROWTH OF WORKING GROUP I, BLOCK J, AND AGE
C           CLASS K IN HUNDREDS OF MERCH. CU. FT.
C      GROWB(I) = GROWTH RATE OF SHELTERWOOD, WORKING GROUP I, BD. FT. IN
C           PCT.
C      GROWC(I) = GROWTH RATE OF SHELTERWOOD, WORKING GROUP I, CU. FT. IN
C           PCT.
C      GRUP(I) = AREA OF WORKING GROUP I IN A COMPARTMENT.
C      GVLBF(I) = TOTAL GROWING STOCK GOAL FOR WORKING GROUP I, M BD. FT.
C      GVLCU(I) = TOTAL GROWING STOCK GOAL FOR WORKING GROUP I, CU. FT.
C           SUM OF APPROPRIATE SUBCF(I,J) FOR SUB-SAWLOG TREES.
C      HELP(I,J) = POTENTIAL NONCOMMERCIAL THINNING IN NEXT PERIOD, ACRES
C           OF TYPE J IN BLOCK I.
C      HT(I) = AVERAGE HEIGHT OF OVERSTORY(I=1) OR UNDERSTORY(I=2).
C      HTSO = TREE HEIGHT BEFORE THINNING.
C      HTST = TREE HEIGHT AFTER THINNING.
C      IBK = BLOCK SOURCE OF INVENTORY RECORD.
C      ISUB = SUBCOMPARTMENT SOURCE OF INVENTORY RECORD.
C      KBK = BLOCK NUMBER.
C      KCMP = COMPARTMENT NUMBER.
C      KSUB(I,J) = SUBCOMPARTMENT NUMBERS OF MAP SQUARES.
C      KTYP(I,J) = TYPE CLASSIFICATION OF MAP SQUARES.
C      MAP = INDEX TO PRINT (1) OR OMIT (0) MAPS.
C      MIN = MINIMUM AGE FOR STAND TO BE INCLUDED IN GROWING STOCK.
C      MNK = TEMPORARY VARIABLE, ASSIGNED MEANINGS AS NEEDED.
C      NBK = NUMBER OF BLOCKS IN WORKING CIRCLE. MUST BE AT LEAST ONE.
C      NCMP = NUMBER OF COMPARTMENTS IN WORKING CIRCLE.
C      NROW = NUMBER OF ROWS IN COMPARTMENT MAP.
C      NSBK(I) = NUMBER OF SUBCOMPARTMENTS IN BLOCK I.
C      NSI(I) = NUMBER OF SITE CLASSES IN WORKING GROUP I.
C      NSUB = NUMBER OF SUBCOMPARTMENTS IN WORKING CIRCLE.
C      NTYP = COVER OR USE TYPE OF INVENTORY PLOT OR SUBCOMPARTMENT.
C      NWGP = NUMBER OF WORKING GROUPS IN WORKING CIRCLE.
C      OPBD(I) = ALLOWABLE ANNUAL CUT IN M BD. FT. FOR WORKING GROUP I
C           WITH BALANCED AGE CLASSES, REGENERATION CUTS.
C      OPCU(I) = ALLOWABLE ANNUAL CUT IN CU. FT. FOR WORKING GROUP I WITH
C           BALANCED AGE CLASSES, REGENERATION CUTS.
C      OPEN(I,J) = POTENTIAL COMMERCIAL THINNING IN NEXT PERIOD, ACRES OF
C           TYPE J IN BLOCK I.
C      OURS = ACRES IN WORKING CIRCLE, EXCLUDING OTHER OWNERSHIP.
C      PABR(I) = DEFORESTED ACRES IN BLOCK I, EXCLUDING UNITS WITH KNOWN
C           AREA ON INVENTORY RECORD.
C      PAFN(I,J,K) = ACRES TO RECEIVE FINAL CUT - WORKING GROUP I, BLOCK
C           J, AGE CLASS K - EXCLUDES AREAS ON INVENTORY RECORD.
C      PAIBD(I) = P.A.I. IN M BD. FT., WORKING GROUP I.
C      PAICU(I) = P.A.I. IN HUNDREDS OF CUBIC FEET, WORKING GROUP I.
C      PARG(I,J,K) = ACRES TO RECEIVE REGENERATION CUT - WORKING GROUP I,
C           BLOCK J, AGE CLASS K - EXCLUDES KNOWN AREAS.
C      PARTY(I,J) = AREA OF TYPE J IN BLOCK I, EXCLUDING UNITS WITH KNOWN
C           AREA ON INVENTORY RECORD.
C      PASI(I,J,K) = ACRES OF WORKING GROUP I, BLOCK J, AND SITE CLASS K,
C           EXCLUDING KNOWN AREAS.
C      PASP(I,J) = AREA OF WORKING GROUP I IN BLOCK J, EXCLUDING UNITS
C           WITH KNOWN AREA ON INVENTORY RECORD.
C      PBFT(I,J) = POTENTIAL YIELD IN M BD. FT. FROM THINNINGS - BLOCK I,
C           TYPE J - EXCLUDING UNITS OF KNOWN AREA.
C      PBRSI(I,J) = DEFORESTED ACRES OF SITE J IN BLOCK I, EXCLUDING
C           UNITS WITH KNOWN AREA ON INVENTORY RECORD.
C      PCMT(I,J) = POTENTIAL YIELD IN MERCH. CU. FT. FROM THINNINGS -
C           BLOCK I, TYPE J - EXCLUDING UNITS OF KNOWN AREA.
C      PCTA(I,J) = POTENTIAL BD. FT. CUT FROM REGENERATION CUTS- BLOCK I,
C           TYPE J - EXCLUDING UNITS OF KNOWN AREA.
C      PCTB(I,J) = POTENTIAL BD. FT. CUT FROM FINAL CUTS - BLOCK I, TYPE
C           J - EXCLUDING UNITS OF KNOWN AREA.
C      PDCFN(I,J) = EXPECTED YIELD IN CU. FT. FROM FINAL CUTS DURING NEXT
C           PERIOD, BLOCK I, TYPE J.
C      PDCFR(I,J) = EXPECTED YIELD IN CU. FT. FROM REGENERATION CUTS NEXT
C           PERIOD, BLOCK I, TYPE J.
C      PDCUT(I) = ACRES IN AGE CLASS WITH BALANCED SERIES OF AGE CLASSES.
C      PGBD(I,J,K) = PERIODIC GROWTH IN M BD. FT. WORKING GROUP I, BLOCK
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C        J, AGE CLASS K, EXCLUOING UNITS OF KNOWN AREA.
C     PGMC(I,J,K) = PERIODIC GROWTH IN MERCH. CU. FT. WORKING GROUP I,
C        BLOCK J, AGE CLASS K, EXCLUOING UNITS OF KNOWN AREA.
C     PHLP(I,J) = POTENTIAL NONCOMMERCIAL THINNING IN NEXT PERIOD, ACRES
C        OE TYPE J IN BLOCK I. RECOROS WITH AREA = 0.0, ONLY.
C     POOR(I) = MINIMUM SITE INDEX FOR MANAGEMENT, WORKING GROUP I.
C     POPN(I,J) = POTENTIAL COMMERCIAL THINNING IN NEXT PERIOD, ACRES OF
C        TYPE J IN BLOCK I. RECOROS WITH AREA = 0.0, ONLY.
C     PPBE(I,J,K) = TOTAL VOLUME IN M BO. ET. FOR WORKING GROUP I, BLOCK
C        J, AGE CLASS K. EXCLUOES UNITS OF KNOWN AREA.
C     PPCR(I,J) = EXPECTEO YIELO IN CU. FT. EROM REGENERATION CUTS -
C        BLOCK I, TYPE J - EXCLUDING UNITS OF KNOWN AREA.
C     PPFN(I,J) = EXPECTEO YIELO IN CU. FT. FROM FINAL CUTS - BLOCK I,
C        TYPE J - EXCLUOING UNITS OF KNOWN AREA.
C     PPMC(I,J,K) = TOTAL VOLUME IN MERCH. CU. FT. FOR WORKING GROUP I,
C        BLOCK J, AND AGE CLASS K. EXCLUOES KNOWN AREAS.
C     PPTC(I,J,K) = SUM OE TOTAL CU. ET. FOR WORKING GROUP I, BLOCK J,
C        AGE CLASS K. EXCLUOES UNITS OF KNOWN AREA.
C     PRET = PERCENTAGE OF TREES RETAINEO AFTER INITIAL THINNING.
C     PROO(I) = BOARO FEET PER TOTAL CUBIC FOOT - CONVERSION FACTOR.
C     PS(I,J,K) = NUMBER OF INVENTORY PLOTS OF WORKING GROUP I, BLOCK J,
C        ANO SITE CLASS K.
C     PSLV(I,J) = BO. FT. VOLUME TO BE SALVAGEO - BLOCK I, TYPE J -
C        EXCLUDING UNITS OF KNOWN AREA.
C     PSPLT(I,J) = NUMBER OE INVENTORY PLOTS OF BLOCK I ANO TYPE J. NOT
C        INCLUDING UNITS OF KNOWN AREA.
C     PTBF(I,J,K) = TOTAL VOLUME IN M BO. FT. FOR WORKING GROUP I, BLOCK
C        J, AND AGE CLASS K.
C     PTCU(I,J,K) = SUM OF TOTAL CU. FT. FOR WORKING GROUP I, BLOCK J,
C        AND AGE CLASS K. IN HUNOREOS OF CU. FT.
C     PTMC(I,J,K) = TOTAL VOLUME IN MERCH. CU. FT. FOR WORKING GROUP I,
C        BLOCK J, AND AGE CLASS K. IN HUNOREOS OF CU. FT.
C     PUNC(I,J) = AREA OF BLOCK I, TYPE J BELOW MINIMUM SITE QUALITY
C        EOR REGULATION, EXCLUOING UNITS OF KNOWN AREA.
C     QUAL(I) = SITE CLASSES PRESENT IN WORKING GROUP I.
C     RAGE(I,J) = ROTATION FOR WORKING GROUP I ANO SITE INDEX J.
C        INCLUOES YEARS IN OELAY(I).
C     RGAC(I) = EXPECTEO ACRES GIVEN REGENERATION CUTS ANNUALLY OURING
C        NEXT PERIOO, WORKING GROUP I.
C     RGBO(I) = EXPECTEO ANNUAL YIELO IN M BO. FT. FROM REGENERATION
C        CUTS DURING NEXT PERIOO, WORKING GROUP I.
C     RGCU(I) = EXPECTEO ANNUAL YIELO IN CU. ET. FROM REGENERATION CUTS
C        OURING NEXT PERIOO, WORKING GROUP I.
C     RINT = NUMBER OE YEARS FOR WHICH GROWTH PROJECTION IS MADE WITH
C        SINGLE COMPUTATION BY A GROWTH EQUATION.
C     ROTA = LONGEST POSSIBLE ROTATION IN YIELO TABLE.
C     SACCE = AREA OF WORKING CIRCLE IN STANOARD ACRES, FROM CU. FT.
C     SAHP(I) = POTENTIAL NONCOMMERCIAL THINNING IN NEXT PERIOO, ACRES
C        IN WORKING GROUP I.
C     SANCUT(I) = ALLOWABLE ANNUAL CUT IN ACRES, WORKING GROUP I.
C     SARETY(I,J) = AREA OF TYPE J IN BLOCK I.
C     SARSC = TOTAL AREA OF SUBCOMPARTMENTS OF A COMPARTMENT.
C     SARSP(I) = TOTAL AREA OF WORKING GROUP I, INCLUOING SHARE OF
C        OEEORESTEO AREA.
C     SATH(I) = POTENTIAL COMMERCIAL THINNING IN NEXT PERIOO, ACRES IN
C        WORKING GROUP I.
C     SBARB = TOTAL BRUSHY OEFORESTEO ACRES IN WORKING CIRCLE.
C     SBARE = TOTAL OEFORESTEO ACRES IN WORKING CIRCLE.
C     SBARG = TOTAL GRASSY OEEORESTEO ACRES IN WORKING CIRCLE.
C     SBOE = M BO. ET. IN WORKING CIRCLE.
C     SBF(I) = TOTAL M BO. ET. IN WORKING GROUP I.
C     SBFR(I) = BO. FT. EROM THINNINGS NEXT PERIOO, WORKING GROUP I.
C     SBH(I) = BO. FT. FROM REGENERATION CUTS OURING NEXT PERIOO,
C        WORKING GROUP I.
C     SBM(I,J) = BO. ET. FROM THINNING OURING NEXT PERIOO, WORKING GROUP
C        I, BLOCK J.
C     SBSV(I) = BO. FT. FROM SALVAGE NEXT PERIOO, WORKING GROUP I.
C     SCA(I,J) = BO. ET. EROM REGENERATION CUTS DURING NEXT PERIOO,
C        WORKING GROUP I, BLOCK J.
C     SCALE = ACRES IN ONE MAP SQUARE.
C     SCB(I,J) = BO. FT. EROM FINAL CUTS NEXT PERIOO, WORKING GROUP I,
C        BLOCK J.
C     SCFM = HUNCREOS OF MERCH. CU. FT. IN WORKING CIRCLE.
C     SCN(I) = EXPECTEO YIELO IN CU. FT. FROM FINAL CUTS OURING NEXT
C        PERIOD, WORKING GROUP I.
C     SCNB(I,J) = EXPECTEO YIELO IN CU. FT. FROM FINAL CUTS OURING NEXT
C        PERIOD, WORKING GROUP I, BLOCK J.
C     SCNT(I) = EXPECTEO YIELO IN CU. FT. EROM FINAL CUTS OURING NEXT
C        PERIOO, TYPE I.
C     SCR(I) = EXPECTEO YIELO IN CU. FT. FROM REGENERATION CUTS OURING
C        NEXT PERIOO, WORKING GROUP I.
C     SCRB(I,J) = EXPECTEO YIELO IN CU. FT. FROM REGENERATION CUTS
C        OURING NEXT PERIOO, WORKING GROUP I, BLOCK J.
C     SCRT(I) = EXPECTEO YIELO IN CU. FT. FROM REGENERATION CUTS OURING
C        NEXT PERIOO, TYPE I.
C     SCU(I,J) = CU. FT. FROM THINNING NEXT PERIOO, WORKING GROUP I,
C        BLOCK J.
C     SCUR(I) = CU. FT. FROM THINNING NEXT PERIOO, WORKING GROUP I.
C     SDBF(I) = TOTAL OIFFERENCE BETWEEN ACTUAL ANO GOAL GROWING STOCKS
C        IN M BO. ET. FOR WORKING GROUP I.
C     SDMC(I) = TOTAL OIFEERENCE BETWEEN ACTUAL ANO GOAL GROWING STOCK
C        IN HUNOREOS OF CU. FT. FOR WORKING GROUP I.
C     SFNL(I) = ACRES FOR FINAL CUT ANNUALLY WITH OVERWOOO AND BALANCEO
C        OISTRIBUTION OF AGE CLASSES, WORKING GROUP I.
C     SFR(I) = BO. FT. FROM FINAL CUTS, NEXT PERIOO, WORKING GROUP I.
C     SHELT(I) = M BO. FT. PER ACRE OF WORKING GROUP I TO BE LEFT AS
C        SEEO SOURCE.
C     SHL(I,J) = POTENTIAL NONCOMMERCIAL THINNING IN NEXT PERIOO,
C        WORKING GROUP I IN BLOCK J.
C     SHWO(I) = CU. FT. PER ACRE RETAINEO AS SEEO TREES OR SHELTERWOOO,
C        WORKING GROUP I.
C     SIOLA = TOTAL ALLOWABLE CUT IN ACRES FOR ONE YEAR IN A BALANCEO
C        WORKING CIRCLE.
C     SIOLB = TOTAL ALLOWABLE CUT IN M BO. FT. FOR ONE YEAR IN A
C        BALANCEO WORKING CIRCLE.
C     SIOLC = TOTAL ALLOWABLE CUT IN CU. FT. FOR ONE YEAR IN A BALANCEO
C        WORKING CIRCLE.
C     SITE = SITE INDEX.
C     SLANC = TOTAL ACRES IN WORKING CIRCLE.
C     SLVG(I,J) = BO. FT. VOLUME TO BE SALVAGEO, BLOCK I, TYPE J.
C     SMC(I) = HUNOREOS OF CUBIC FEET OF WORKING GROUP I IN WORKING
C        CIRCLE.
C     SMPL = ACRES OF TYPE J OF BLOCK I REPRESENTED BY ONE INVENTORY PLOT.
C     SMSP(I) = AREA OF WORKING GROUP I IN WORKING CIRCLE.
C     SOP(I,J) = POTENTIAL COMMERCIAL THINNING IN NEXT PERIOO, WORKING
C        GROUP I IN BLOCK J.
C     SOPTA(I) = TOTAL ALLOWABLE CUT IN ACRES FOR ONE YEAR IN BALANCEO
C        WORKING GROUP I.
C     SOPTB(I) = TOTAL M BO. FT. CUT IN ONE YEAR WITH A BALANCEO SERIES
C        OF AGE CLASSES, WORKING GROUP I.
C     SOPTC(I) = TOTAL CU. FT. CUT IN ONE YEAR WITH A BALANCEO SERIES OF
C        AGE CLASSES, WORKING GROUP I.
C     SPLT(I,J) = NUMBER OF INVENTORY PLOTS REPRESENTING TIMBER
C        TYPE J OF BLOCK I.
C     SSL(I,J) = BO. FT. FROM SALVAGE NEXT PERIOO, WORKING GROUP I,
C        BLOCK J.
C     SSPT = TOTAL OE INVENTORY PLOTS IN WORKING CIRCLE.
C     SSTAC = AREA OF WORKING CIRCLE IN STANOARD ACRES FROM BOARO FEET.
C     STACF(I) = AREA OF SITE CLASS I IN STANOARO ACRES - FROM CU. FEET.
C     STBS(I) = BO. FT. FROM THINNINGS OURING NEXT PERIOO, TYPE I.
C     STC(I) = TOTAL CU. FT. OF WORKING GROUP I IN WORKING CIRCLE.
C     STCF = TOTAL CU. FT. IN WORKING CIRCLE, IN HUNOREOS.
C     STOAC(I) = AREA OF SITE CLASS I IN STANOARO ACRES - FROM BO. FEET.
C     STFO(I) = BO. FT. FROM FINAL CUTS OURING NEXT PERIOO, TYPE I.
C     STHBF = CURRENT POTENTIAL PERIOOIC YIELO FROM THINNINGS, TOTAL FOR
C        WORKING CIRCLE IN M BO. FT.
C     STHCM = CURRENT POTENTIAL PERIOOIC YIELO FROM THINNINGS, TOTAL FOR
C        WORKING CIRCLE IN HUNOREOS OF CUBIC FEET.
C     STHP(I) = POTENTIAL NONCOMMERCIAL THINNING IN NEXT PERIOO, ACRES
C        OF TYPE I.
C     STHR(I) = BO. FT. FROM REGENERATION CUTS OURING NEXT PERIOO, TYPE I.
C     STLV(I) = BO. FT. FROM SALVAGE OURING NEXT PERIOO, TYPE I.
C     STNC(I) = CU. FT. FROM THINNING OURING NEXT PERIOO, TYPE I.
C     STON(I) = POTENTIAL COMMERCIAL THINNING IN NEXT PERIOO, ACRES OF
C        TYPE I.
C     STRY = STANO COMPONENT USEO TO TYPE THE STANO. ENTER 1 IF THE
C        UNOERSTORY WAS USEO. OTHERWISE LEAVE BLANK.
C     STYP(I) = ACRES OF TYPE I IN WORKING CIRCLE.
C     SUBBF(I,J) = GROWING STOCK GOAL FOR WORKING GROUP I, SITE CLASS J.
C        M BO. FT. IN SAWLOG TREES.
C     SUBCF(I,J) = GROWING STOCK GOAL FOR WORKING GROUP I, SITE CLASS J.
C        CUBIC FEET IN TREES BELOW SAWLOG SIZE.
C     SUBTY(I) = TYPE OF SUBCOMPARTMENT I.
C     SUMCF(I) = TOTAL GROWING STOCK GOAL FOR WORKING GROUP I IN MERCH.
C        CU. FT. SUM OF APPROPRIATE ALLCF(I,J) FOR ENTIRE STANOS.
C     SUNC = TOTAL LOW SITE ACRES IN WORKING CIRCLE.
C     TBA(I) = BASAL AREA AFTER THINNING TO SPECIFIEO LEVEL NOW (I=1) OR
C        IN TIME YEARS (I=2).
C     TBD(I) = M BO. FT. AFTER THINNING TO SPECIFIED LEVEL NOW (I=1) OR
C        IN TIME YEARS (I=2).
C     TCF(I) = TOTAL CUBIC FEET IN BLOCK I.
C     TCM(I) = HUNOREOS OF CU. FT. AFTER THINNING TO SPECIFIEO LEVEL NOW
C        (I=1) OR IN TIME YEARS (I=2).
C     TCSP(I,J) = TOTAL CU. ET. OF WORKING GROUP I IN BLOCK J.
C     TDM(I) = AVERAGE O.B.H. AFTER THINNING TO SPECIEIEO LEVEL NOW
C        (I=1) OR IN TIME YEARS (I=2).
C     TEM = TEMPORARY VARIABLE, ASSIGNEO MEANINGS AS NEEDEO.
C     THAC(I) = POSSIBLE ACRES TO THIN ANNUALLY OURING NEXT PERIOO,
C        WORKING GROUP I.
C     THB = AVERAGE POTENTIAL VOLUME FROM THINNING, M BO. FT.
C     THBO(I) = EXPECTEO ANNUAL YIELO IN M BO. FT. FROM THINNINGS OURING
C        NEXT PERIOO, WORKING GROUP I.
C     THC = AVERAGE POTENTIAL VOLUME FROM THINNING, HUNOREOS OF CU. FT.
C     THCU(I) = EXPECTEO ANNUAL YIELO IN CU. FT. FROM THINNINGS OURING
C        NEXT PERIOO, WORKING GROUP I.
C     THIN(I) = GROWING STOCK LEVEL, INITIAL THINNING, WORKING GROUP I.
C     TIME = NUMBER OF YEARS IN PLANNING PERIOO. BASIS FOR WORK INDEX.
C     TMBR = TOTAL TIMBEREO AREA IN WORKING CIRCLE.
C     TMPO = TOTAL AREA OF FOREST TYPES IN WORKING CIRCLE, INCLUOING
C        NONSTOCKEO TYPES.
C     TOT(I) = TOTAL CUBIC FEET IN OVERSTORY(I=1) OR UNOERSTORY(I=2).
C     TOTAC(I) = TOTAL ACRES EXPECTEO TO BE TREATEO IN ONE YEAR OURING
C        NEXT PERIOO, WORKING GROUP I.
C     TOTBO(I) = EXPECTEO TOTAL ANNUAL YIELO IN M BO. FT. OURING NEXT
C        PERIOD, WORKING GROUP I.
C     TOTC = TOTAL CUBIC FEET REMOVEO PER ACRE.
C     TOTCU(I) = EXPECTEO TOTAL ANNUAL YIELO IN CU. FT. OURING NEXT
C        PERIOD, WORKING GROUP I.
C     TOTO = TOTAL CUBIC EEET PER ACRE BEFORE THINNING.
C     TOTT = TOTAL CUBIC FEET PER ACRE AFTER THINNING.
C     TPB(I,J) = NUMBER OE INVENTORY PLOTS, WORKING GROUP I, BLOCK J.
C     TVL(I) = TOTAL CU. FT. AFTER THINNING TO SPECIFIED LEVEL NOW (I=1)
C        OR IN TIME YEARS (I=2).
C     TYPNM(I) = OESCRIPTION OF VEGETATIVE TYPE OR USE TYPE NUMBER I.
C     UNCML(I,J) = AREA OF BLOCK I AND TIMBER TYPE J BELOW MINIMUM
C        SITE QUALITY EOR TIMBER MANAGEMENT ANO REGULATION.
C     UNIT(I) = NUMBER OF MAP SQUARES IN SUBCOMPARTMENT I.
C     VLBF(I) = VOLUME IN M BO. FT. CUT FROM SITE I.
C     VLCU(I) = VOLUME IN CU. FT. CUT FROM SITE I.
C     WHEN = YEAR OF FIRST GROWING SEASON AFTER INVENTORY WAS MAOE.
C     WORK = COOE FOR TREATMENT IN NEXT PERIOO, ASO
C          0 = OO NOTHING THIS PERIOO
C          1 = PLANT OR SEEO
C          2 = THIN
C          3 = SALVAGE
C          4 = REGENERATION CUT
C          5 = REMOVE SEEO TREES OR SHELTERWOOO
C          6 = REMOVE OVERWOOO AND THIN RESIOUAL
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
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     3UTA(5,12),CUTB(5,12),CYCL,OATE(3),OLEV(3),FINL(3),FORET(3),GRBO(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWC(3),S
     7LANO,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUOCF(3,IO),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),OELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBO(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PROO(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BOMAI(3),CUMAI(3),PAIBO(3),PAICU(3),OBHO
     3,OENO,REST,OBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      CALL BASIS
C
C CALL APPROPRIATE ROUTINE TO COMPUTE AREAS.
C
      CALL AREA2
C
C COMPUTE PRESENT VOLUMES, FUTURE GROWTH, ETC. FROM INVENTORY OATA.
C
      CALL GOT
C
C COMPUTE GROWING STOCK GOALS ANO AREA CONTROL.
C
      CALL GOAL
C
C OETERMINE OIFFERENCES BETWEEN PRESENT FOREST ANO GOALS. PRINT A
C GUIOE TO MANAGEMENT.
C
      CALL GUIOE
      CALL EXIT
      ENO
      SUBROUTINE BASIS
C
C TO INITIALIZE OR REAO VARIABLES THAT APPLY TO THE WORKING CIRCLE.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,OATE(3),OLEV(3),FINL(3),FORET(3),GRBO(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,IO),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWD(3),S
     7LANO,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,IO),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),OELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBO(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PROO(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BOMAI(3),CUMAI(3),PAIBO(3),PAICU(3),OBHO
     3,OENO,REST,OBHT,BAST,NWGP,HELP(5,I2),BA(2)
C
C INITIALIZE VARIABLES APPLICABLE TO THE WORKING CIRCLE.
C
      MNK = 0
      NSUB = 0
      SBARB = 0.0
      SBARE = 0.0
      SBARG = 0.0
      SLANO = 0.0
      TEM = 0.0
      TMBR = 0.0
      TMPO = 0.0
      OO 1 I=1,5
      ACBAR(I) = 0.0
      ARBK(I) = 0.0
      NSBK(I) = 0
      OO 1 J=1,20
    1 SARETY(I,J) = 0.0
      OO 2 I=1,20
    2 STYP(I) = 0.0
      OC 3 I=1,3
      ACINT(I) = 0.0
      ALOWC(I) = 0.0
      ALWBF(I) = 0.0
      BCMAI(I) = 0.0
      BFINT(I) = 0.0
      CUINT(I) = 0.0
      CUMAI(I) = 0.0
      FNBO(I) = 0.0
      FNCU(I) = 0.0
      OPBO(I) = 0.0
      OPCU(I) = 0.0
      PAIBO(I) = 0.0
      PAICU(I) = 0.0
      OO 3 J=1,5
      ACSP(I,J) = 0.0
      OC 3 K=1,10
    3 ACSI(I,J,K) = 0.0
      OO 4 I=1,3
      OO 4 J=I,5
      OO 4 K=1,15
      ACFNL(I,J,K) = 0.0
      ACRGN(I,J,K) = 0.0
      GRBO(I,J,K) = 0.0
    4 GRMC(I,J,K) = 0.0
      OO 5 I=I,5
      OC 5 J=1,10
    5 BARSI(I,J) = 0.0
      OO 6 I=1,3
      GVLBF(I) = 0.0
      GVLCU(I) = 0.0
      NSI(I) = 0
      SARSP(I) = 0.0
      SUMCF(I) = 0.0
      SBF(I) = 0.0
      SMC(I) = 0.0
      SMSP(I) = 0.0
      OO 6 J=1,10
      ALLCF(I,J) = 0.0
      ANCUT(I,J) = 0.0
      AREA(I,J) = 0.0
      CFBF(I,J) = 0.0
      SUBBF(I,J) = 0.0
      SUBCF(I,J) = 0.0
    6 CCNTINUE
      OC 7 I=1,3
      DC 7 J=1,I5
      ABFAG(I,J) = 0.0
      AMCAG(I,J) = 0.0
      BFAGE(I,J) = 0.0
    7 CFAGE(I,J) = C.0
      OC 8 I=I,5
      OO 8 J=1,12
      BFTH(I,J) = 0.0
      CMTH(I,J) = 0.0
      CUTA(I,J) = 0.0
      CUTB(I,J) = 0.0
      HELP(I,J) = 0.0
      OPEN(I,J) = 0.0
      PCCFN(1,J) = 0.0
      PCCFR(I,J) = 0.0
      SLVG(1,J) = 0.0
    8 CONTINUE
      OC 9 I=1,2
      BA(I) = 0.0
      FCTR(I) = 0.0
      PROO(I) = 0.0
      VCM(I) = 0.0
    9 CCNTINUE
C
C REAO INITIAL VALUES OF APPROPRIATE VARIABLES.
C
      REAO (5,14) (FORET(1),I=1,3)
   I4 FCRMAT (3A8)
      REAO (5,16) (TYPNM(I),I=1,20)
   I6 FORMAT (8A10)
      REAO (5,18) NBK,NCMP,NWGP,MIN
   18 FORMAT (4I4)
      REAO (5,20) ROTA,CYCL,RINT,COMCU,BFMRCH,TIME
   20 FORMAT (6F8.3)
      REAO (5,23) GROWB(I),GROWC(1),FINL(1),OLEV(I),THIN(1),POOR(1),SHEL
     1T(1),SHWO(1),COMBF(I),OELAY(1),AOJ(1)
   23 FORMAT (2F5.3,9F4.1)
      REAO (5,23) GROWO(2),GROWC(2),FINL(2),OLEV(2),THIN(2),POOR(2),SHEL
     1T(2),SHWO(2),COMBF(2),OELAY(2),AOJ(2)
C
C REAO ROTATICN LENGTHS. ENTER RAGE(KAK,I) FOR SITE INOEX 10, RAGE(KAK,2)
C FOR SITE INOEX 20, ETC., EVEN THOUGH SITES BELOW POOR(KAK) WILL NOT BE
C MANAGEO. THIS KEEPS ARRAYS IN OROER EVEN IF PCOR(KAK) VARIES BY
C WORKING GROUP.
C
      REAO (5,24) (RAGE(1,I),I=1,10)
   24 FORMAT (10F4.0)
      REAO (5,24) (RAGE(2,I),I=1,IO)
      REAO (5,I4) (OATE(I),I=1,3)
C
C PRINT PAGE TYPE 4 - RECORO OF VALUES REAO BY THIS ROUTINE.
C
      WRITE (6,39)
   39 FORMAT (1H1,///,61X,11HPAGE TYPE 4)
      WRITE (6,40)
   40 FORMAT (1H0,39X,53HRECORO OF MANAGEMENT OECISIONS ANO CURRENT CONO
     1ITIONS)
      WRITE (6,41) (FORET(1),I=1,3)
   41 FORMAT (1H ,56X,3A8,//)
      WRITE (6,42) NBK,NCMP
   42 FORMAT (1H ,10X,I8HNUMBER OF BLOCKS -,I3,32X,24HNUMBER OF COMPARTM
     1ENTS -,14)
      WRITE (6,43) MIN,CYCL
   43 FORMAT (1H0,10X,31HMINIMUM AGE FOR GROWING STOCK -,I3,19X,32HLENGT
     1H OF CUTTING CYCLE, YEARS -,F5.0)
      WRITE (6,44) BFMRCH,RINT
   44 FORMAT (1H0,10X,37HMINIMUM M BO. FT. FOR GROWING STOCK -,F5.1,11X,
     136HLENGTH OF PREOICTION PERIOO, YEARS -,F4.0)
      WRITE (6,45) TIME
   45 FORMAT (1H0,IOX,34HLENGTH OF PLANNING PERIOO, YEARS -,F4.0,/)
      WRITE (6,46)
   46 FORMAT (1H0,58X,4HPINE,10X,6HSPRUCE)
      WRITE (6,47)
   47 FORMAT (1H ,58X,5HGROUP,9X,5HGROUP)
      WRITE (6,48) POOR(1),POOR(2)
   48 FCRMAT (1H0,IOX,31HLOWEST SITE CLASS TO BE MANAGEO,14X,F7.1,8X,F7.
     11)
      WRITE (6,49) AOJ(1),AOJ(2)
   49 FORMAT I1H0,10X,34HLENGTH OF AOJUSTMENT PERIOO, YEARS,11X,F7.1,8X,
     1F7.1)
      WRITE (6,50) SHELT(1),SHELT(2)
   50 FORMAT (1H0,10X,35HM BO. FT. TO BE LEFT AS SEEO SOURCE,IOX,F7.1,8X
     I,F7.1)
      WRITE (6,51) SHWO(I),SHWO(2)
   5I FORMAT (1H0,10X,33HCU. FT. TO BE LEFT AS SEED SOURCE,I2X,F7.1,8X,F
     I7.1)
      WRITE (6,53) FINL(1),FINL(2)
   53 FORMAT (1H0,10X,38HYEARS TO LEAVE OVERWOOO AS SEEO SOURCE,7X,F7.1,
     18X,F7.1)
      WRITE (6,55) OELAY(1),OELAY(2)
   55 FORMAT (1H0,10X,37HEXPECTEO OELAY IN REGENERATION, YEARS,8X,F7.1,8
     1X,F7.1)
      WRITE (6,57) GROWB(1),GROWB(2)
   57 FORMAT (1H0,10X,38HBO. FT. GROWTH OF SHELTERWCOO, PERCENT,7X,F8.2,
     17X,F8.2)
      WRITE (6,58) GROWC(1),GROWC(2)
   58 FORMAT (1H0,10X,38HCU. FT. GROWTH OF SHELTERWOOO, PERCENT,7X,F8.2,
     17X,F8.2)
      WRITE (6,60) THIN(1),THIN(2)
   60 FORMAT (1H0,10X,35HSTOCKING LEVEL FOR INITIAL THINNING,10X,F7.1,8X
     1,F7.1)
      WRITE (6,61) OLEV(I),OLEV(2)
   61 FORMAT (1H0,10X,36HSTOCKING LEVEL, SUBSEQUENT THINNINGS,9X,F7.1,8X
     1,F7.1)
```

```
      WRITE (6,63) COMBF(1),COMBF(2)
   63 FCRMAT (1HO,10X,33HMINIMUM COMMERCIAL CUT, M BO. FT.,12X,F7.1,8X,F
     17.1)
      WRITE (6,64) COMCU,COMCU
   64 FORMAT (1HO,10X,31HMINIMUM COMMERCIAL CUT, CU. FT.,14X,F7.1,8X,F7.
     11)
      WRITE (6,70)
   70 FORMAT (1HO,//,11X,22HCUBIC FEET IN HUNOREOS)
      RETURN
      ENO
      SUBROUTINE AREA2
C
C TO CDMPUTE TYPE AREAS WHEN COMPARTMENT AREAS ARE NOT KNOWN.
C
      CDMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,1D),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,OATE(3),DLEV(3),FINL(3),FORET(3),GRBO(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWC(3),S
     7LANO,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),OELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBD(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PROO(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BOMAI(3),CUMAI(3),PAIBO(3),PAICU(3),OBHO
     3,DENO,REST,OBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      OIMENSION SPL(5),SPLT(5,12),TMTY(5),OBH(2),HT(2),OEN(2),AGE(2)
C
C INITIALIZE VARIABLES OEFINEO BY THIS SUBROUTINE.
C
      DC 2 I=1,5
      SPL(I) = D.0
      TMTY(I) = 0.0
      DO 2 J=1,12
    2 SPLT(I,J) = D.0
      TMPO = 0.0
C
C READ AREAS CF BLOCKS AND OF NON-TIMBER TYPES.
C
      READ (5,5) (ARBK(I),I=1,NBK)
    5 FORMAT (5F8.1)
      OC 7 I=1,NBK
      REAO (5,6) (SARETY(I,J),J=13,20)
    6 FCRMAT (BF8.1)
    7 CCNTINUE
C
C COMPUTE TOTAL AREAS OCCUPIEO BY TIMBER TYPES.
C
      DD 11 I=1,NBK
      TEM = 0.0
      OC 10 J=13,20
   10 TEM = TEM + SARETY(I,J)
      TMTY(I) = ARBK(I) - TEM
   11 TMPO = TMPO + TMTY(1)
C
C REAO INVENTORY RECOROS TO COUNT THEM BY BLOCK, TYPE, ETC. LAST
C RECORC HAS ZERO OR VERY LARGE VALUE FOR IBK TC STCP PROCESSING.
C LOGICAL UNIT 4 HOLOS THE INVENTORY TAPE.
C
   15 REAO (4,16) IBK,KOMP,ISUB,QTR1,QTR2,SECT,TOWN,RANG,SITE,STRY,NTYP,
     1WCRK,OBH(1),HT(1),OEN(1),AGE(1),OBH(2),HT(2),DEN(2),AGE(2),ACRE,WH
     2EN
   16 FORMAT (I2,I4,I3,3A3,2A4,F4.0,F2.0,I3,F3.0,F4.1,F3.0,F5.0,F4.0,F4.
     11,F3.0,F5.D,F4.0,F5.1,F5.0)
      IF(IBK .EQ. 0 .OR. IBK .GT. NBK) GO TO 20
      IF(ACRE .EQ. 0.0) GO TO 17
      SARETY(IBK,NTYP) = SARETY(IBK,NTYP) + ACRE
      TMTY(IBK) = TMTY(IBK) - ACRE
      GD TO 15
   17 SPLT(IBK,NTYP) = SPLT(IBK,NTYP) + 1.0
      GC TO 15
C
C TOTAL PLOTS BY BLOCK.
C
   20 DO 21 I=1,NBK
      OC 21 J=1,12
   21 SPL(I) = SPL(I) + SPLT(I,J)
C
C COMPUTE TYPE AREAS WITHIN EACH BLOCK.
C
      OO 26 I=1,NBK
      IF(SPL(I) .EQ. D.0) GO TO 26
      TEM = TMTY(I) / SPL(I)
      OO 25 J=1,12
      SARETY(1,J) = SARETY(I,J) + (SPLT(I,J) * TEM)
   25 CCNTINUE
   26 CONTINUE
C
C SUM TYPE AREAS TO GET BLOCK ANO WORKING CIRCLE TCTALS.
C
      OO 30 I=1,NBK
      OO 30 J=1,20
      STYP(J) = STYP(J) + SARETY(I,J)
   30 CONTINUE
      OC 31 I=1,NBK
      SBARB = SBARB + SARETY(I,11)
      SBARG = SBARG + SARETY(I,12)
      ACBAR(I) = ACBAR(I) + SARETY(I,11) + SARETY(I,12)
   31 CONTINUE
      OO 32 I=1,NBK
      OO 32 J=1,5
      MNK = J + 5
      ACSP(1,I) = ACSP(1,1) + SARETY(I,J)
   32 ACSP(2,I) = ACSP(2,I) + SARETY(I,MNK)
      SBARE = SBARB + SBARG
      OO 33 I=1,NBK
      SLANO = SLANO + ARBK(I)
      OC 33 J=1,NWGP
      SMSP(J) = SMSP(J) + ACSP(J,I)
   33 CCNTINUE
C
C WRITE PAGE TYPE 5 - AREAS OF TYPES AND WORKING GRCUPS.
C
      WRITE (6,34)
   34 FCRMAT (1H1,////,59X,11HPAGE TYPE 5)
      WRITE (6,35) (FORET(I),I=1,3)
   35 FORMAT (1HO,48X,32HAREAS OF TYPES IN WCRKING CIRCLE/1H ,54X,3A8/1H
     10,30X,10HCOVER TYPE,11X,5HACRES,6X,1H*,6X,10HCOVER TYPE,11X,5HACRE
     2S,/)
      DO 37 I=1,10
      J = I + 10
      WRITE (6,36) I,TYPNM(I),STYP(I),J,TYPNM(J),STYP(J)
   36 FORMAT (1HO,28X,I2,2X,A10,4X,F12.1,4X,1H*,4X,I2,2X,A10,4X,F12.1)
   37 CCNTINUE
      WRITE (6,38) SLANO
   38 FORMAT (1HO,73X,10HTOTAL AREA,2X,F12.1)
      WRITE (6,39) SMSP(1),SMSP(2),SBARE
   39 FORMAT (1HO,//,22X,12HPINE GROUP -,F12.1,6X,14HSPRUCE GROUP -,F12.
     11,3X,18HDEFORESTEO ACRES -,F12.1)
C
C PRINT PAGE TYPE 6 - SUMMARY OF AREAS BY BLOCK ANO WORKING CIRCLE.
C
      WRITE (6,40)
   40 FORMAT (1H1,////,59X,11HPAGE TYPE 6)
      WRITE (6,41)
   41 FORMAT (1HO,44X,40HTOTAL AREAS OF BLOCKS ANO WORKING CIRCLE)
      WRITE (6,42) (FORET(I),I=1,3)
   42 FORMAT (1H ,53X,3A8)
      WRITE (6,43)
   43 FORMAT (1HO,//,4X,5HBLOCK,10X,5HTOTAL,14X,44H****** PLANTABLE ACRE
     1S FOREST SOIL *********,19X,23HFOREST AND REGENERATING)
      WRITE (6,44)
   44 FORMAT (1H ,4X,3HNO.,11X,5HACRES,14X,6HBRUSHY,13X,6HGRASSY,14X,5HT
     1OTAL,19X,4HPINE,13X,6HSPRUCE,//)
      OO 51 I=1,NBK
      WRITE (6,50) I,ARBK(I),SARETY(I,11),SARETY(I,12),ACBAR(I),ACSP(1,I
     1),ACSP(2,I)
   50 FORMAT (1HO,4X,I2,8X,F10.1,10X,F10.1,9X,F10.1,9X,F10.1,13X,F10.1,9
     1X,F10.1)
   51 CCNTINUE
      WRITE (6,52) SLANO,SBARB,SBARG,SBARE,SMSP(1),SMSP(2)
   52 FCRMAT (1HO,//,4X,5HTOTAL,6X,F10.1,10X,F10.1,9X,F10.1,9X,F10.1,13X
     1,F10.1,9X,F10.1)
      WRITE (6,60)
   60 FORMAT (1HO,///,55X,21HOESIGNATIONS OF TYPES)
      OC 62 I=1,10
      J = I + 10
      WRITE (6,61) I,TYPNM(I),J,TYPNM(J)
   61 FORMAT (1HO,43X,I2,4X,A10,6X,1H*,6X,I2,4X,A10)
   62 CCNTINUE
      RETURN
      ENO
      SUBROUTINE VOLS
C
C TO CONVERT TOTAL CU. FT. TO MERCH. CU. FT. ANO TO BO. FT.
C
      CCMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARS1(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,OATE(3),OLEV(3),FINL(3),FORET(3),GRBO(3,
     45,15),GRMC(3,5,15),GRCWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWD(3),S
     7LANO,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),TH1N(3),TMBR,TMPO,TYPNM(20),OELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,PDCFR(5,12),POCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBO(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PRCO(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BOMAI(3),CUMAI(3),PA1BO(3),PAICU(3),OBHO
     3,DENO,REST,OBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      DC 2 I=1,2
      FCTR(I) = 0.D
    2 PROO(I) = 0.0
      IF(KAK .EQ. 2) GO TO 20
      OO 14 I=1,KNO
C
C COMPUTE MERCH. CU. FT. OF FIRST SPECIES.
C
      IF(VOM(I) .LT. 5.0) GO TO 14
      IF(VDM(I) .GT. 6.7) GO TO 4
      FCTR(I) = 0.26612 * VOM(I) - 1.12689
      GD TO 8
    4 IF(VDM(I) .GT. 10.4) GO TO 6
      FCTR(I) = 3.46993 - 0.12017 * VOM(I) - 13.41984 / VOM(I)
      GO TO 8
    6 FCTR(1) = 0.99666 - 0.66932 / VOM(I)
C
C COMPUTE BO. FT. OF FIRST SPECIES.
C
    8 IF(VOM(I) .LT. 8.0) GO TO 14
      IF(VOM(I) .GT. 11.9) GO TO 10
      PROO(I) = 0.87783 * VOM(I) + 0.00660 * BA(I) - 7.27957
      GC TO 14
   10 PROO(I) = 5.10752 + 0.10712 * VOM(I) + 0.00185 * BA(I) - 36.20229
     1 / VOM(I)
   14 CONTINUE
      RETURN
   20 OC 32 I=1,KNO
C
C COMPUTE MERCH. CU. FT. OF SECONO SPECIES.
C
      IF(VCM(I) .LT. 5.0) GO TO 32
      IF(VOM(I) .GT. 6.8) GO TO 22
      FCTR(1) = 0.28253 * VOM(I) - 1.19723
      GC TO 26
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   22 IF(VDM(I) .GT. 10.0) GO TO 24
      FCTR(I) = 3.17119 - 11.77668 / VDM(I) - 0.10560 * VDM(I)
      GO TO 26
   24 FCTR(I) = 0.98488 - 0.45681 / VDM(I)
C
C COMPUTE BD. FT. OF SECOND SPECIES
C
   26 IF(VDM(I) .LT. 8.0) GO TO 32
   28 IF(VDM(I) .GT. 11.5) GO TO 30
      PROD(I) = 0.86587 * VDM(I) - 6.54505
      GO TO 32
   30 PROD(I) = 11.21673 - 71.48795 / VDM(I) - 0.13545 * VDM(I)
   32 CONTINUE
      RETURN
      END
      SUBROUTINE CUTS
C
C TO ESTIMATE INCREASE IN AVERAGE D.B.H. DUE TO THINNING.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,DATE(3),DLEV(3),FINL(3),FORET(3),GRBD(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWD(3),S
     7LAND,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),DELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),DPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBD(3),BFINT(3),DPBD(3),TEM,MNK,KND,FCTR(2),PROD(2),KAK,VDM(2)
     2,ADJ(3),ALOWC(3),ALWBF(3),BDMAI(3),CUMAI(3),PAIBD(3),PAICU(3),DBHO
     3,DENO,REST,DBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      IF(DBHO .LT. 9.4) GO TO 30
C
C COMPUTE D.B.H. IF DBHO IS LARGE ENOUGH FOR BASAL AREA TO REMAIN CONSTANT.
C
      PRET = 100.0
      DO 21 KJ=1,100
      IF(PRET .LT. 50.0) GO TO 5
      IF(KAK .EQ. 2) GO TO 1
      DBHE = 0.73365 + 1.02008 * DBHO - 0.01107 * (PRET - 50.0) - 0.0001
     14 * (PRET - 50.0) * (PRET - 50.0)
      GO TO 11
    1 DBHE = DBHO + 1.05308 - 0.02106 * (PRET - 50.0)
      GO TO 11
    5 IF(KAK .EQ. 2) GO TO 6
      PDBHE = 0.49401 + 0.71890 * ALOG10(DBHO) - 0.22530 * ALOG10(PRET)
     1 + 0.12616 * ALOG10(DBHO) * ALOG10(PRET)
      GO TO 10
    6 PDBHE = 0.26136 + 0.93849 * ALOG10(DBHO) - 0.09292 * ALOG10(PRET)
   10 DBHE = 10.0 ** PDBHE
   11 IDBHE = DBHE  * 10.0 + 0.5
      DBHE = IDBHE
      DBHE = DBHE * 0.1
      DENE = DENO * PRET * 0.01
      NDENE = DENE + 0.5
      DENE = NDENE
      BASE = 0.0054542 * DBHE * DBHE * DENE
      NBASE = BASE * 10.0 + 0.5
      BASE = NBASE
      BASE = BASE * 0.1
      TMPY = 0.0054542 * DBHE * DBHE
      TEM = BASE - REST
      IF(TEM .LE. TMPY) GO TO 70
      IF(TEM .LT. 4.0) GO TO 20
      PRET = PRET - 1.0
      GO TO 21
   20 PRET = PRET - 0.3
   21 CONTINUE
      GO TO 70
C
C COMPUTE D.B.H. IF BASAL AREA INCREASES WITH D.B.H.
C
   30 PRET = 40.0
      IF(DBHO .GT. 7.0) PRET = 70.0
      DO 65 J=1,100
      IF(PRET .GE. 50.0) GO TO 40
      IF(KAK .EQ. 2) GO TO 35
      PDBHE = 0.49401 + 0.71890 * ALOG10(DBHO) - 0.22530 * ALOG10(PRET)
     1 + 0.12616 * ALOG10(DBHO) * ALOG10(PRET)
      GO TO 36
   35 PDBHE = 0.26136 + 0.93849 * ALOG10(DBHO) - 0.09292 * ALOG10(PRET)
   36 DBHE = 10.0 ** PDBHE
      GO TO 45
   40 IF(KAK .EQ. 2) GO TO 41
      DBHE = 0.73365 + 1.02008 * DBHO - 0.01107 * (PRET - 50.0) - 0.0001
     14 * (PRET - 50.0) * (PRET - 50.0)
      GO TO 45
   41 DBHE = DBHO + 1.05308 - 0.02106 * (PRET - 50.0)
   45 IDBHE = DBHE * 10.0 + 0.5
      DBHE = IDBHE
      DBHE = DBHE * 0.1
      DENE = DENO * (PRET * 0.01)
      NDENE = DENE + 0.5
      DENE = NDENE
      BASE = 0.0054542 * DBHE * DBHE * DENE
      NBASE = BASE * 10.0 + 0.5
      BASE = NBASE
      BASE = BASE * 0.1
      BREAK = 49.9 * REST / 80.0
      IF(BASE .GT. BREAK) GO TO 50
      DBHP = (80.0 / REST) * (0.08682 * BASE) + 0.94636
      GO TO 52
   50 BUST = 66.2 * (REST / 80.0)
      IF(BASE .GT. BUST) GO TO 51
      DBHP = (80.0 / REST) * (0.10938 * BASE) - 0.17858
      GO TO 52
   51 TMPY = BASE * (80.0 / REST)
      TEM = TMPY * TMPY
      DBHP = 19.04740 * TMPY - 0.26673 * TEM + 0.0012539 * TEM * TMPY
     1 - 448.76833
      IF(TMPY .GT. 80.0) DBHP = DBHO + 0.8
   52 IDBHP = DBHP * 10.0 + 0.5
      DBHP = IDBHP
      DBHP = DBHP * 0.1
      IF(DBHP - DBHE) 60,70,61
   60 PRET = PRET * 1.02
      GO TO 65
   61 PRET = PRET * 0.98
   65 CONTINUE
   70 DBHT = DBHE
C
C COMPUTE POST-THINNING BASAL AREA.
C
      IF(DBHT .GT. 5.0) GO TO 75
      SQFT = 11.58495 * DBHT - 11.09724
      GO TO 76
   75 IF(DBHT .GE. 10.0) GO TO 77
      TEM = DBHT * DBHT
      SQFT = 7.76226 * DBHT +0.85289 * TEM -0.07952 * TEM * DBHT-3.45624
   76 BAST = (REST / 80.0) * SQFT
      GO TO 80
   77 BAST = REST
   80 RETURN
      END
      SUBROUTINE GOT
C
C TO COMPUTE PRESENT VOLUMES, DISTRIBUTIONS OF AREA AND VOLUME, AND
C POTENTIAL GROWTH FROM INVENTORY DATA.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,DATE(3),DLEV(3),FINL(3),FORET(3),GRBD(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWD(3),S
     7LAND,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),DELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),DPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBD(3),BFINT(3),DPBD(3),TEM,MNK,KND,FCTR(2),PROD(2),KAK,VDM(2)
     2,ADJ(3),ALOWC(3),ALWBF(3),BDMAI(3),CUMAI(3),PAIBD(3),PAICU(3),DBHO
     3,DENO,REST,DBHT,BAST,NWGP,HELP(5,12),BA(2)
C
C VARIABLES LISTED IN DIMENSION AFTER TVL(I) ARE NEEDED ONLY IF ANY
C INVENTORY RECORDS HAVE ACRE = 0.0.
C
      DIMENSION BFBLK(5),BFSP(3,5),BFTB(5,12),CFMER(5),CFTB(5,12),CMSP(3
     1,5),CMTB(5,12),DBH(2),DEN(2),FBA(2),FBD(2),FDM(2),FDN(2),FHT(2),FM
     2C(2),FVL(2),HT(2),PTBF(3,5,15),PTCU(3,5,15),PTMC(3,5,15),SPLT(5,12
     3),TCF(5),TCSP(3,5),UNCML(5,12),AGE(2),STC(3),BAS(2),TOT(2),CM(2),B
     4FM(2),TBA(2),TBD(2),TDM(2),TCM(2),TVL(2),PAFN(3,5,15),PARG(3,5,15)
     5,PSPLT(5,12),PASI(3,5,10),PBFT(5,12),PBRSI(5,10),PCMT(5,12),PCTA(5
     6,12),PCTB(5,12),PGBD(3,5,15),PGMC(3,5,15),POPN(5,12),PPBF(3,5,15),
     7PPCR(5,12),PPFN(5,12),PPMC(3,5,15),PPTC(3,5,15),PS(3,5,10),PSLV(5,
     812),PUNC(5,12),TPB(3,5),PARTY(5,20),PABR(5),PASP(3,5),PHLP(5,12)
C
C INITIALIZE VARIABLES FIRST DEFINED IN THIS SUBROUTINE.
C
      SBDF = 0.0
      SCFM = 0.0
      SSPT = 0.0
      STCF = 0.0
      SUNC = 0.0
      TMPO = 0.0
      DO 2 I=1,3
      STC(I) = 0.0
      DO 2 J=1,5
      BFSP(I,J) = 0.0
      CMSP(I,J) = 0.0
      PASP(I,J) = 0.0
      TCSP(I,J) = 0.0
      TPB(I,J) = 0.0
      DO 2 K=1,15
      PAFN(I,J,K) = 0.0
      PARG(I,J,K) = 0.0
      PGBD(I,J,K) = 0.0
      PGMC(I,J,K) = 0.0
      PPBF(I,J,K) = 0.0
      PPMC(I,J,K) = 0.0
      PPTC(I,J,K) = 0.0
      PTBF(I,J,K) = 0.0
      PTCU(I,J,K) = 0.0
      PTMC(I,J,K) = 0.0
    2 CONTINUE
      DO 4 I=1,5
      BFBLK(I) = 0.0
      CFMER(I) = 0.0
      PABR(I) = 0.0
      TCF(I) = 0.0
      DO 4 J=1,12
      BFTB(I,J) = 0.0
      CFTB(I,J) = 0.0
      CMTB(I,J) = 0.0
      PBFT(I,J) = 0.0
      PCMT(I,J) = 0.0
      PCTA(I,J) = 0.0
      PCTB(I,J) = 0.0
      PHLP(I,J) = 0.0
      POPN(I,J) = 0.0
      PPCR(I,J) = 0.0
      PPFN(I,J) = 0.0
      PSLV(I,J) = 0.0
      PSPLT(I,J) = 0.0
      PUNC(I,J) = 0.0
      SPLT(I,J) = 0.0
      UNCML(I,J) = 0.0
```

```
    4 CCNTINUE
      OC 5 I=1,3
      OC 5 J=1,5
      OO 5 K=1,10
      PASI(I,J,K) = 0.0
    5 PS(I,J,K) = 0.0
      CC 6 I=I,5
      OO 6 J=1,10
    6 PBRSI(I,J) = 0.0
C
C CREATE OUPLICATE RECORO OF AREAS COMPUTEO BY PREVIOUS ROUTINE.
C
      OC 8 I=I,NWGP
      OC 8 J=1,NBK
    8 PASP(I,J) = ACSP(I,J)
      OO 9 I=I,NBK
      CC 9 J=1,20
    9 PARTY(I,J) = SARETY(I,J)
C
C INITIALIZE VARIABLES RECOMPUTEO FOR EACH INVENTORY RECORO.
C
   IO OC II I=1,2
      BAS(I) = 0.0
      BFM(I) = 0.0
      CM(I) = 0.0
      FBA(I) = 0.0
      FBO(I) = 0.0
      FCM(I) = 0.0
      FCN(I) = 0.0
      FHT(I) = 0.0
      FMC(I) = 0.0
      FVL(I) = 0.0
      TBA(I) = 0.0
      TBO(I) = 0.0
      TCM(I) = 0.0
      TCM(I) = 0.0
      TVL(I) = 0.0
   11 TCT(I) = 0.0
      BAUS = 0.0
      BCUS = 0.0
      BFVOL = 0.0
      CFVOL = 0.0
      CMUS = 0.0
      OMUS = 0.0
      ONUS = 0.0
      FTBO = 0.0
      FTCM = 0.0
      HTUS = 0.0
      STORI = 0.0
      STOR2 = 0.0
      TEM = MIN
      TMBO = 0.0
      TMCF = 0.0
      VLUS = 0.0
C
C REAO INVENTORY OATA, ONE RECORO AT A TIME.
C LOGICAL UNIT 4 HOLOS THE INVENTORY TAPE.
C
      READ (4,12) IBK,KOMP,ISUB,QTR1,QTR2,SECT,TOWN,RANG,SITE,STRY,NTYP,
     IWCRK,OBH(1),HT(1),OEN(1),AGE(1),OBH(2),HT(2),OEN(2),AGE(2),ACRE,WH
     2EN
   12 FORMAT (I2,I4,I3,3A3,2A4,F4.0,F2.0,I3,F3.0,F4.1,F3.0,F5.0,F4.0,F4.
     1I,F3.0,F5.0,F4.0,F5.I,F5.0)
C
C STOP VOLUME COMPUTATIONS IF ALL INVENTORY RECCROS REAO.
C
      IF(IBK .EQ. 0 .OR. IBK .GT. NBK) GO TO I50
C
C CONTINUE COMPUTATIONS IF ALL RECCROS NOT REAO.
C
      PARTY(IBK,NTYP) = PARTY(IBK,NTYP) - ACRE
      STOR1 = HT(I)
      STOR2 = HT(2)
      JS = (AGE(I) + 9.0) * 0.1
      IF(STRY .GT. C.0) JS = (AGE(2) + 9.0) * 0.1
      IF(JS .GT. 15) JS = 15
C
C COUNT TOTAL NUMBER OF INVENTORY RECOROS BY BLCCK ANO TYPE.
C
      SPLT(IBK,NTYP) = SPLT(IBK,NTYP) + 1.0
      IF(ACRE .GT. 0.0) GO TO I6
      PSPLT(IBK,NTYP) = PSPLT(IBK,NTYP) + I.0
   16 ISI = (SITE + 4.0) * 0.I
      IF(ISI .LT. I) GO TO 10
      IF(NTYP .LF. IO) GO TO 1B
      IF(ACRE .EQ. 0.0) GO TO 17
      BARSI(IBK,ISI) = BARSI(IBK,ISI) + ACRE
      GO TO IO
   17 PBRSI(IBK,ISI) = PBRSI(IBK,ISI) + 1.0
      GO TO 10
   1B IF(NTYP .GT. O .ANO. NTYP .LT. 6) KAK = 1
      IF(NTYP .GT. 5 .ANO. NTYP .LT. I1) KAK = 2
      IF(ACRE .EQ. 0.0) GO TO I9
      ACSI(KAK,IBK,ISI) = ACSI(KAK,IBK,ISI) + ACRE
      PASP(KAK,IBK) = PASP(KAK,IBK) - ACRE
      GO TO 20
   I9 PS(KAK,IBK,ISI) = PS(KAK,IBK,ISI) + I.0
   20 IF(SITE .GE. POOR(KAK)) GO TO 22
      IF(ACRE .EQ. 0.0) GO TO 21
      UNCML(IBK,NTYP) = UNCML(IBK,NTYP) + ACRE
      GO TO 10
   21 PUNC(IBK,NTYP) = PUNC(IBK,NTYP) + 1.0
      GO TO IO
   22 IF(OBH(I) .GT. 0.0) GO TO 26
C
C TEST FOR NONCOMMERCIAL THINNING IN VERY YOUNG STANOS.
C
      IF(WORK .NE. 2.0) GO TO 10
      IF(ACRE .EQ. C.0) GO TO 25
      HELP(IBK,NTYP) = HELP(IBK,NTYP) + ACRE
```

```
      GC TO IO
   25 PHLP(IBK,NTYP) = PHLP(IBK,NTYP) + 1.0
      GC TO IC
C
C COMPUTE BASAL AREAS ANO VOLUMES PER ACRE.
C
   26 OC 29 I=1,2
      BAS(I) = 0.0054542 * OBH(I) * OBH(I) * OEN(I)
      IF(OBH(I) .LT. 3.0) GO TO 29
      IF(AGE(I) .LT. TEM) GO TO 29
      IF(NTYP .GT. 5) GO TO 28
      O2H = OBH(I) * OBH(I) * HT(I)
      IF(O2H .GT. 600C.0) GO TO 27
      TOT(I) = (0.C0225 * O2H - 0.CC074 * BAS(I) + 0.03711) * OEN(I)
      GO TO 29
   27 TOT(I) = (0.00247 * O2H + 0.C0I30 * BAS(I) - 1.40286) * OEN(I)
      GO TO 29
   28 TOT(I) = 0.50 * BAS(I) * HT(I) + 16.96
   29 CCNTINUE
C
C IF WORK COOEO FOR THINNING, VERIFY THAT IT CAN BE CONE.
C
      IF(WCRK .EQ. 2.0) GO TO 30
      IF(WORK .EQ. 6.0) GO TO 31
      GO TO 38
   30 K = 1
      GC TO 32
   31 K = 2
   32 IF(OBH(K) .LT. 2.0) GO TO 38
      IF(OBH(K) .GT. 5.0) GC TO 33
      LEVL = 80.0 * BAS(K) / (11.58495 * OBH(K) - 11.09724)
      TMPY = THIN(KAK)
      GC TO 36
   33 IF(OBH(K) .GE. 10.0) GO TO 34
      TEM = OBH(K) * OBH(K)
      LEVL = 80.0 * BAS(K) / (7.76226 * OBH(K) + 0.85289 * TEM - 0.07952
     1* TEM * CBH(K) - 3.45624)
      GO TO 35
   34 LEVL = BAS(K)
   35 TMPY = OLEV(KAK)
   36 IF(WORK .EQ. 6.0) GO TO 37
      IF(LEVL .LE. TMPY) WCRK = 0.0
      GO TO 38
   37 IF(LEVL .LE. TMPY) WORK = 5.0
   38 IF(TOT(1) .EQ. 0.0) GO TO 48
C
C CONVERT TOTAL CU. FT. TO OTHER UNITS.
C
      IF(OBH(1) .LT. 5.0) GO TO 40
      KNO = 2
      BA(1) = BAS(1)
      BA(2) = BAS(2)
      VOM(I) = OBH(1)
      VCM(2) = OBH(2)
      CALL VOLS
      OO 39 I=I,2
      BFM(I) = TOT(I) * PROC(I) * 0.001
   39 CM(I) = TOT(I) * FCTR(I) * 0.01
   40 OO 4I I=I,2
   41 TCT(I) = TOT(I) * 0.0I
C
C ACO VOLUMES TO APPROPRIATE TOTALS.
C
      TMCF = CM(1) + CM(2)
      TMBO = BFM(1) + BFM(2)
      IF(ACRE .EQ. 0.0) GO TO 45
      PTCU(KAK,IBK,JS) = PTCU(KAK,IBK,JS) + (TOT(1) + TCT(2)) * ACRE
      PTMC(KAK,IBK,JS) = PTMC(KAK,IBK,JS) + (TMCF * ACRE)
      IF(TMBO .LT. BFMRCH) GO TO 48
      PTBF(KAK,IBK,JS) = PTBF(KAK,IBK,JS) + (TMBO * ACRE)
      GO TO 48
   45 PPTC(KAK,IBK,JS) = PPTC(KAK,IBK,JS) + TOT(1) + TOT(2)
      PPMC(KAK,IBK,JS) = PPMC(KAK,IBK,JS) + TMCF
      IF(TMBC .LT. BFMRCH) GO TO 48
      PPBF(KAK,IBK,JS) = PPBF(KAK,IBK,JS) + TMBO
C
C COMPUTE GROWTH FOR NEXT PERIOO BY WORKING GROUP, BLOCK, ANO AGE CLASS.
C
   48 IF(WORK .NE. 3.0) GO TO 5I
      IF(BFM(1) .LT. COMBF(KAK)) GO TO 10
      IF(ACRE .EQ. C.0) GO TO 50
      SLVG(IBK,NTYP) = SLVG(IBK,NTYP) + (BFM(I) * ACRE)
      GO TO 10
   50 PSLV(IBK,NTYP) = PSLV(IBK,NTYP) + BFM(I)
      GO TO 10
   5I TMOY = AGE(1) + TIME
      TEM = MIN
      IF(TMOY .LT. TEM) GO TO 66
      SBAS = BAS(1) + BAS(2)
      IF(SBAS .EQ. C.0) GO TO 66
      J = TIME / RINT
      CO 62 K=1,J
      IF(KAK .EQ. 2) GO TO 56
      OC 55 I=I,2
      TMOY = AGE(I) + TIME
      IF(TMOY .LT. TEM) GO TO 55
      FOM(I) = 0.88511 * OBH(I) + 1.29735 * ALOG10(HT(I)) + 0.00119 * OB
     1H(I) * SITE + 62.37174 / SBAS - I.56975
      IF(OBH(I) .GE. 10.0) GO TO 52
      FCN(I) = 0.00247 + 0.00124 * OBH(I) + 0.C0028 * OBH(I) * OBH(I) +
     10.C000052I * SBAS * SBAS - 0.C000905 * OBH(I) * SBAS
      IF(FON(I) .LT. 0.0) FON(1) = 0.0
      FON(I) = OEN(I) * (1.0 - FON(I))
      MNK = FON(I) + 0.5
      FCN(I) = MNK
      GC TO 53
   52 FCN(I) = OEN(I)
   53 FBA(I) = 0.0054542 * FOM(I) * FOM(I) * FON(I)
      FHT(I) = 15.43021 + 1.107 * HT(I) - 0.08637 * AGE(I) - 304.I2172 /
     1SITE - 0.02447 * SITE * SBAS / 100.0
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      02H = FOM(() * FOM(I) * FHT(I)
      IF(02H .GT. 6000.0) GO TO 54
      FVL(I) = (0.00225 * 02H - 0.00074 * FBA(I) + 0.037I1) * FON(I)
      GC TO 55
   54 FVL(I) = (0.00247 * D2H + 0.C0130 * FBA(I) - I.40286) * FCN(I)
   55 CONTINUE
      GO TD 60
   56 00 59 I=1,2
      TMOY = AGE(I) + TIME
      IF(TMOY .LT. TEM) GD TO 59
      FCM(I) = 0.2631 + 0.95287 * OBH(I) + 0.0016 * OBH(I) * SITE + 16.4
     16662 / SBAS
      IF(OBH(I) .GE. 10.0) GD TO 57
      FCN(I) = 0.05285 - 0.C1346 * OBH(I) + 0.00226 * OBH(I) * CBH(() +
     10.0000066 * SBAS * SBAS - 0.0C01931 * OBH(I) * SBAS
      IF(FON(I) .LT. 0.0) FCN(() = 0.0
      FON(I) = OEN(I) * (1.0 - FON(I))
      MNK = FON(I) + 0.5
      FCN(I) = MNK
      GO TO 58
   57 FCN(I) = OEN(I)
   58 FBA(I) = 0.0054542 * FOM(I) * FOM(I) * FON(I)
      FHT(I) = 14.57349 + 1.101 * HT(() - 0.09654 * AGE(I) - 333.37172 /
     1SITE - 0.04321 * SITE * SBAS / 1C0.0
      FVL(1) = 0.50 * FBA(I) * FHT(I) + 16.96
   59 CONTINUE
   60 (F(J .EQ. 1) GO TO 62
      DO 61 (=1,2
      AGE(I) = AGE(I) + RINT
      OBH(I) = FCM(()
      OEN(I) = FON(()
      HT(1) = FHT(I)
   6I CCNTINUE
      SBAS = FBA(1) + FBA(2)
   62 CONT1NUE
C
C CONVERT TOTAL CU. FT. TO OTHER UN(TS.
C
      IF(FOM(1) .LT. 5.0) GO TO 66
      KND = 2
      BA(1) = FBA(1)
      BA(2) = FBA(2)
      VOM(1) = FOM(1)
      VCM(2) = FOM(2)
      CALL VOLS
      OC 65 1=1,2
      FBD(I) = FVL(I) * PRDO(I) * 0.001
      FMC(I) = FVL(I) * FCTR(I) * 0.01
   65 CDNTINUE
C
C ADO PER(ODIC GRDWTH IF ND WORK IS PLANNEO OURING NEXT PERIDD.
C
   66 1F(WORK .GT. 1.0) GD TO 70
      IF(ACRE .EQ. 0.0) GD TD 67
      GRBO(KAK,IBK,JS) = GRBO(KAK,IBK,JS) + (FBD(1)+FBO(2)-TMBO) * AGRE
      GRMC(KAK,IBK,JS) = GRMC(KAK,IBK,JS) + (FMC(1)+FMC(2)-TMCF) * ACRE
      GO TO 10
   67 PGBD(KAK,IBK,JS) = PGBO(KAK,IBK,JS) + FBO(1) + FBD(2) - TMBD
      PGMC(KAK,IBK,JS) = PGMC(KAK,IBK,JS) + FMC(1) + FMC(2) - TMCF
      GD TD 10
C
C CDMPUTE FUTURE UNTHINNED UNDERSTDRY IF OVERSTORY IS REOUCEO NOW.
C
   70 1F(WDRK .LT. 4.0) GD TD B5
      1F(WDRK .GT. 5.0) GD TD B5
      IF(DBH(2) .ED. 0.0) GD TO B5
      IF(KAK .EQ. 2) GO TD 74
      DMUS = 0.BB5I1 * DBH(2) + 1.29735 * ALDG10(HT(2)) + 0.00119 * DBH(
     12) * SITE + 62.37174 / BAS(2) - 1.56975
      IF(DBH(2) .GE. I0.0) GO TO 71
      DNUS = 0.00247 + 0.00124 * DBH(2) + 0.C002B * OBH(2) * DBH(2) + O.
     100000521 * BAS(2) * BAS(2) - 0.0C00905 * OBH(2) * BAS(2)
      IF(ONUS .LT. 0.0) DNUS = 0.0
      DNUS = OEN(2) * (1.0 - DNUS)
      MNK = DNUS + 0.5
      DNUS = MNK
      GC TD 72
   71 DNUS = CEN(2)
   72 BAUS = 0.0054542 * OMUS * DMUS * ONUS
      HTUS = 15.43021 + 1.107 * HT(2) - 0.08637 * AGE(2) - 304.12172 / S
     1ITE - 0.02447 * SITE * BAS(2) / 100.0
      02H = OMUS * OMUS * HTUS
      IF(02H .GT. 6000.0) GO TO 73
      VLUS = (0.00225 * D2H - 0.00074 * BAUS + 0.03711) * ONUS
      GO TO 77
   73 VLUS = (0.C0247 * 02H + 0.00130 * BAUS - 1.40286) * ONUS
      GC TO 77
   74 DMUS = 0.2631 + 0.95287 * DBH(2) + 0.0016 * DBH(2) * SITE + 16.466
     162 / BAS(2)
      IF(DBH(2) .GE. 10.0) GO TD 75
      ONUS = 0.05285 - 0.01346 * DBH(2) + 0.00226 * OBH(2) * DBH(2) + O.
     10000066 * BAS(2) * BAS(2) - 0.0001931 * OBH(2) * BAS(2)
      1F(DNUS .LT. 0.0) ONUS = 0.0
      DNUS = OEN(2) * (1.0 - DNUS)
      MNK = ONUS + 0.5
      DNUS = MNK
      GD TO 76
   75 ONUS = OEN(2)
   76 BAUS = 0.0054542 * DMUS * DMUS * DNUS
      HTUS = 14.57349 + 1.101 * HT(2) - 0.09654 * AGE(2) - 333.37172 / S
     1ITE - 0.04321 * SITE * BAS(2) / 100.0
      VLUS = 0.50 * BAUS * HTUS + 16.96
   77 IF(OMUS .LT. 5.0) GO TD B5
      KND = 1
      BA(I) = BAUS
      VCM(1) = OMUS
      CALL VOLS
      BOUS = VLUS * PROD(1) * 0.001
      CMUS = VLUS * FCTR(1) * 0.01
C
C CETERMINE POTENTIAL WORK LOAO FOR NEXT PER(OO. CREOIT FUTURE CUTS
C WITH HALF PER(CO(C GROWTH CBTAINEO (F NOT CUT.
C INCLUCE STANDS NEAR ROTATION AGE IN POTENT(AL REGENERATION CUTS
C REGARCLESS CF WORK (NOEX.
C
   85 IF(WORK .EQ. 2.0) GO TO 105
      IF(WCRK .GT. 4.0) GO TO 95
C
C COMPUTE GROWTH ANC YIELO OF STANOS TO BE REGENERATEO IN NEXT PER(OO.
C
      TEM = GRCWB(KAK) * TIME * 0.01
      DMY = SHELT(KAK)
      TMPY = (FBD(1) + BFM(I)) * C.5
      (F(TMPY .LT. CMY) OMY = TMPY
      (F(ACRE .EC. C.0) GD TO 86
      GRBD(KAK,IBK,JS) = GRBO(KAK,IBK,JS) + (FBO(2) + BOUS - BFM(2) - BF
     1M(2) + FBD(I) - BFM(1) + OMY * TEM) * 0.5 * ACRE
      ACRGN(KAK,IBK,JS) = ACRGN(KAK,IBK,JS) + ACRE
      GC TC B7
   86 PGBO(KAK,IBK,JS) = PGBO(KAK,(BK,JS) + (FBO(2) + BOUS - BFM(2) - BF
     1M(2) + FBO(1) - BFM(1) + OMY * TEM) * 0.5
      PARG(KAK,(BK,JS) = PARG(KAK,IBK,JS) + 1.0
   B7 TEM = GROWC(KAK) * T(ME * 0.C1
      DMY = SHWO(KAK)
      TMPY = (FMC(I) + CM(I)) * 0.5
      (F(TMPY .LT. OMY) OMY = TMPY
      (F(ACRE .EO. 0.0) GO TO BB
      GRMC(KAK,(BK,JS) = GRMC(KAK,IBK,JS) + (FMC(2) + CMUS - CM(2) - CM(
     12) + FMC(1) - CM(1) + OMY * TEM) * 0.5 * ACRE
      GC TO 89
   8B PGMC(KAK,(BK,JS) = PGMC(KAK,1BK,JS) + (FMC(2) + CMUS - CM(2) - CM(
     12) + FMC(1) - CM(1) + OMY * TEM) * 0.5
   B9 BFVOL = (BFM(I) + FBC(1)) * 0.5 - SHELT(KAK)
      CFVOL = (CM(1) + FMC(1)) * 0.5 - SHWO(KAK)
      IF(BFVOL .LT. COMBF(KAK)) GO TO 91
      ADO = BFVOL * (0.63B21 + 2B.99151 / OBH(1))
      ACO = CFVOL - AOO
      (F(AOO .LT. CCMCU) AOO = 0.0
      IF(ACRE .EQ. 0.0) GO TO 90
      CUTA((BK,NTYP) = CUTA((BK,NTYP) + (BFVDL * ACRE)
      PCCFR((BK,NTYP) = POCFR(IBK,NTYP) + (AOD * ACRE)
      GO TD 10
   90 PCTA(IBK,NTYP) = PCTA(IBK,NTYP) + BFVCL
      PPCR(IBK,NTYP) = PPCR(IBK,NTYP) + ADD
      GO TO 1C
   91 (F(CFVOL .LT. CDMCU) GO TO 10
      (F(ACRE .EC. 0.0) GD TD 92
      PCCFR(IBK,NTYP) = POCFR(IBK,NTYP) + (CFVDL * ACRE)
      GO TO 10
   92 PPCR(IBK,NTYP) = PPCR(IBK,NTYP) + CFVCL
      GO TD 10
C
C CDMPUTE GRDWTH ANO Y(ELO OF STANOS TO LDSE DVERSTCRY IN NEXT PER(DD.
C
   95 IF(ACRE .ED. 0.0) GD TD 96
      GRBO(KAK,IBK,JS) = GRBD(KAK,(BK,JS)+((FBO(1) - BFM(1)) * 0.5)*ACRE
      GRMC(KAK,IBK,JS) = GRMC(KAK,IBK,JS)+((FMC(1) - CM(1)) * 0.5)*ACRE
      ACFNL(KAK,IBK,JS) = ACFNL(KAK,IBK,JS) + ACRE
      GC TO 97
   96 PGBO(KAK,IBK,JS) = PGBD(KAK,(BK,JS) + (FBO(1) - BFM(1)) * 0.5
      PGMC(KAK,IBK,JS) = PGMC(KAK,IBK,JS) + (FMC(1) - CM(1)) * 0.5
      PAFN(KAK,(BK,JS) = PAFN(KAK,IBK,JS) + 1.0
   97 BFVOL = (BFM(1) + FBO(1)) * C.5
      CFVOL = (CM(1) + FMC(1)) * 0.5
      IF(BFVOL .LT. CDMBF(KAK)) GO TO 99
      AOO = BFVDL * (0.63B21 + 2B.99151 / DBH(I))
      ACD = CFVDL - AOD
      IF(AOD .LT. COMCU) ACD = 0.0
      (F(ACRE .EQ. 0.0) GO TD 98
      CUTB(IBK,NTYP) = CUTB(IBK,NTYP) + BFVOL * ACRE
      PDCFN(IBK,NTYP) = POCFN(IBK,NTYP) + (AOD * ACRE)
      GC TD 101
   9B PCTB((BK,NTYP) = PCTB(IBK,NTYP) + BFVOL
      PPFN(IBK,NTYP) = PPFN(IBK,NTYP) + ADD
      GC TD 101
   99 1F(CFVOL .LT. CDMCU) GD TD 101
      IF(ACRE .EQ. 0.0) GD TO 100
      PDCFN(IBK,NTYP) = PDCFN(IBK,NTYP) + CFVOL * ACRE
      GC TD I01
  I00 PPFN(IBK,NTYP) = PPFN(1BK,NTYP) + CFVDL
  101 IF(WDRK .GT. 5.0) GD TD 105
      (F(ACRE .EQ. 0.0) GD TD 102
      GRBO(KAK,IBK,JS) = GRBD(KAK,IBK,JS) + (FBO(2) - BFM(2) + BOUS - BF
     1M(2)) * 0.5 * ACRE
      GRMC(KAK,IBK,JS) = GRMC(KAK,(BK,JS) + (FMC(2) - CM(2) + CMUS - CM(
     12)) * 0.5 * ACRE
      GO TO I0
  102 PGBD(KAK,IBK,JS) = PGBO(KAK,IBK,JS) + (FBD(2) - BFM(2) + BDUS - BF
     1M(2)) * 0.5
      PGMC(KAK,IBK,JS) = PGMC(KAK,1BK,JS) + (FMC(2) - CM(2) + CMUS - CM(
     12)) * 0.5
      GC TD 10
  105 HT(1) = STDR1
      HT(2) = STDR2
C
C GET VOLUME IF THINNEO NDW ANO (F TH(NNED IN TIME YEARS.
C
      K = 1
      (F(WDRK .ED. 6.0) K = 2
      00 110 I=1,2
      REST = OLEV(KAK)
      (F(I .EQ. 2) GD TD 106
      (F(DBH(K) .EO. 0.0) GD TD 110
      IF(OBH(K) .LT. 6.0) REST = THIN(KAK)
      DBHD = OBH(K)
      DEND = OEN(K)
      GO TO I07
  106 IF(FOM(K) .EQ. 0.0) GD TD 110
```

```
      IF(FOM(K) .LT. 6.0) REST = THIN(KAK)
      CPHO = FCM(K)
      CFNO = FDN(K)
  I07 CALL CUTS
      THA(I) = HAST
      TCM(I) = DBHT
      IF(I .EC. 1) SAVE = PRET
      IF(I .EC. 2) HT(K) = FHT(K)
      IF(KAK .EQ. 2) GD TO 109
      HT(K) = HT(K) + 7.64B33 - 3.B22B6 * ALOG10(PRET)
      TEM = TBA(I) / (0.0054542 * TDM(I) * TOM(I))
      O2H = TCM(I) * TCM(I) * HT(K)
      IF(D2H .GT. 6CC0.0) GO TD 108
      TVL(I) = (C.00225 * D2H - 0.CC074 * TBA(I) + 0.03711) * TEM
      GC TO 110
  108 TVL(I) = (C.OC247 * O2H + 0.00130 * TBA(I) - 1.402B6) * TEM
      GC TD I10
  109 TVL(I) = 0.50 * TBA(I) * HT(K) + 16.96
  I10 CCNTINUE
C
C CCNVERT TOTAL CU. FT. TO CTHER UNITS.
C
      IF(TDM(2) .LT. 5.0) GD TD 120
      KND = 2
      BA(1) = TBA(1)
      BA(2) = TBA(2)
      VCM(1) = TOM(1)
      VCM(2) = TCM(2)
      CALL VDLS
      DC 117 I=1,2
      IF(TVL(I) .EC. 0.0) GO TD 117
      TBD(I) = TVL(I) * PRDD(I) * C.001
      TCM(I) = TVL(I) * FCTR(I) * 0.01
  117 CCNTINUE
C
C GET STATUS AT END DF PERIDO DF A PLOT THINNED AT START OF PERICD.
C
  120 J = TIME / RINT
      HT(I) = STDR1
      IF(K .EC. 2) HT(1) = STDR2
      IF(KAK .EO. 2) GO TO 12B
      CC 125 I=1,J
      IF(TBA(1) .LE. 0.0) GD TO 125
      HT(1) = HT(1) + 7.64B33 - 3.B22B6 * ALDG10(SAVE)
      FCM(1) = 1.0097*TDM(1)+0.0096*SITE-1.5766*ALOG10(TBA(1))+3.3021
      FHT(1) = 15.43021 + 1.107 * HT(1) - 0.0B637 * AGE(K) - 304.12172 /
     1SITE - 0.02447 * SITE * TBA(1) / 100.0
      MNK = (TBA(1) / (0.0054542 * TOM(1) * TOM(1))) + 0.5
      IF(TOM(1) .LT. 1C.0) GO TO 121
      FCN(I) = MNK
      GC TD 122
  12I FDN(1) = 0.00247 + 0.C0124 * TDM(1) + 0.CC02B * TOM(1) * TOM(1) +
     10.C000052I * TBA(I) * TBA(1) - 0.0C00905 * TDM(1) * TBA(1)
      IF(FON(I) .LT. 0.0) FDN(1) = 0.0
      TEM = MNK
      NKM = TEM * (1.0 - FDN(1)) + 0.5
      FDN(1) = NKM
  122 FBA(1) = FDN(1) * 0.0054542 * FDM(1) * FDM(1)
      TCM(1) = FCM(1)
      TBA(1) = FBA(1)
      HT(1) = FHT(1)
      AGE(K) = AGE(K) + RINT
  125 CCNTINUE
      D2H = FDM(1) * FDM(1) * FHT(1)
      IF(O2H .GT. 60C0.0) GD TO 127
      FVL(1) = (0.00225 * O2H - 0.CC074 * FBA(I) + C.03711) * FDN(1)
      GC TO 132
  I27 FVL(1) = (0.00247 * O2H + 0.0C130 * FBA(1) - 1.402B6) * FDN(1)
      GC TO 132
  I2B DC 13I I=1,J
      IF(TBA(1) .LE. 0.0) GD TO 131
      FCM(1) = 1.0222*TOM(1)+0.0151*SITE-1.2417*ALDG10(TBA(1))+2.145
      FHT(1) = 14.57349 + 1.101 * HT(1) - 0.09654 * AGE(K) - 333.37172 /
     1SITE - 0.04321 * SITE * TBA(1) / 100.0
      IF(TDM(1) .LT. 1C.0) GD TO 129
      MNK = (TBA(1) / (0.0054542 * TOM(1) * TOM(1))) + 0.5
      FCN(1) = MNK
      GC TD 130
  129 TEM = 0.052B5 - 0.01346 * TDM(1) + 0.00226 * TOM(1) * TDM(1) + 0.0
     1000066 * TBA(1) * TBA(1) - 0.0001931 * TDM(1) * TBA(1)
      IF(TEM .LT. 0.0) TEM = 0.0
      MNK = FCN(1) * (1.0 - TEM) + 0.5
      FCN(1) = MNK
  130 FBA(1) = FDN(1) * 0.0054542 * FDM(1) * FOM(1)
      TCM(1) = FOM(1)
      TBA(1) = FBA(1)
      HT(1) = FHT(1)
      AGE(K) = AGE(K) + RINT
  131 CCNTINUE
      FVL(1) = 0.50 * FBA(1) * FHT(1) + 16.96
  132 IF(FCM(1) .LT. 5.0) GC TO 134
C
C CDNVERT TOTAL CU. FT. TO DTHER UNITS.
C
      KND = 1
      BA(1) = FBA(1)
      VCM(1) = FDM(1)
      CALL VDLS
      FTBD = FVL(1) * PROD(1) * 0.001
      FTCM = FVL(1) * FCTR(1) * 0.01
      IF(ACRE .EQ. 0.0) GO TO 133
      GRBO(KAK,IBK,JS) = GRBO(KAK,IBK,JS) + (FBD(K) - BFM(K) + FTBD - TB
     1D(1)) * 0.5 * ACRE
      GRMC(KAK,IBK,JS) = GRMC(KAK,IBK,JS) + (FMC(K) - CM(K) + FTCM - TCM
     1(1)) * 0.5 * ACRE
      GD TO 134
  133 PGBO(KAK,IBK,JS) =PGBO(KAK,IBK,JS)+(FBO(K)-BFM(K)+FTBO-TBO(1))*0.5
      PGMC(KAK,IBK,JS) =PGMC(KAK,IBK,JS)+(FMC(K)-CM(K)+FTCM-TCM(1))*0.5
C
C ASSIGN THINNINGS TO BO. FT. OR CU. FT. TOTALS, IF COMMERCIAL.
C
  134 THB = (FBD(K) - TBD(2) + BFM(K) - TBD(I)) * 0.5
      THC = (FMC(K) - TCM(2) + CM(K) - TCM(1)) * 0.5
      IF(THB .LT. CCMBF(KAK)) GO TD 140
      ADO = THB * (0.63B21 + 28.99151 / OBH(K))
      ACD = THC - ACC
      IF(ACD .LT. COMCU) ACD = 0.0
      IF(ACRE .EC. C.0) GO TO I39
      BFTH(IBK,NTYP) = BFTH(IBK,NTYP) + (THB * ACRE)
      CMTH(IBK,NTYP) = CMTH(IBK,NTYP) + (ADO * ACRE)
      OPEN(IBK,NTYP) = OPEN(IBK,NTYP) + ACRE
      GC TO I0
  I39 PBFT(IBK,NTYP) = PBFT(IBK,NTYP) + THB
      PCMT(IBK,NTYP) = PCMT(IBK,NTYP) + ADO
      PCPN(IBK,NTYP) = POPN(IBK,NTYP) + I.0
      GC TC 10
  140 IF(THC .LT. COMCU) GD TO 145
      IF(ACRE .EC. 0.0) GD TO 141
      CMTH(IBK,NTYP) = CMTH(IBK,NTYP) + (THC * ACRE)
      OPEN(IBK,NTYP) = OPEN(IBK,NTYP) + ACRE
      GC TO 10
  14I PCMT(IBK,NTYP) = PCMT(IBK,NTYP) + THC
      PCPN(IBK,NTYP) = PDPN(IBK,NTYP) + 1.0
      GC TO 10
C
C MAKE RECDRD OF NONCOMMERCIAL THINNINGS.
C
  145 IF(ACRE .EC. C.0) GO TO 146
      HELP(IBK,NTYP) = HELP(IBK,NTYP) + ACRE
      GD TO 10
  146 PHLP(IBK,NTYP) = PHLP(IBK,NTYP) + 1.0
      GC TO I0
C
C THIS ENDS PROCESSING OF INDIVIOUAL INVENTCRY RECCRDS.
C
C COMPUTE TDTAL VOLUMES BY WORKING GROUP, BLCCK, ANO AGE CLASS.
C
  150 DC 159 I=1,NWGP
      OC 159 J=1,NBK
      K = 1
      IF(I .EC. 2) K = 6
      IF(PSPLT(J,K) .EQ. 0.0) GO TC 152
      TEM = PARTY(J,K) / PSPLT(J,K)
      CC 151 MNK=1,3
      PGBO(I,J,MNK) = PGBD(I,J,MNK) * TEM
      PGMC(I,J,MNK) = PGMC(I,J,MNK) * TEM
      PPBF(I,J,MNK) = PPBF(I,J,MNK) * TEM
      PPTC(I,J,MNK) = PPTC(I,J,MNK) * TEM
      PPMC(I,J,MNK) = PPMC(I,J,MNK) * TEM
  151 CCNTINUE
  152 K = K + 1
      IF(PSPLT(J,K) .EC. 0.0) GO TD I54
      TEM = PARTY(J,K) / PSPLT(J,K)
      DO 153 MNK=4,5
      PGBO(I,J,MNK) = PGBO(I,J,MNK) * TEM
      PGMC(I,J,MNK) = PGMC(I,J,MNK) * TEM
      PPBF(I,J,MNK) = PPBF(I,J,MNK) * TEM
      PPTC(I,J,MNK) = PPTC(I,J,MNK) * TEM
      PPMC(I,J,MNK) = PPMC(I,J,MNK) * TEM
  I53 CCNTINUE
  154 K = K + 1
      IF(PSPLT(J,K) .EQ. 0.0) GD TC 156
      TEM = PARTY(J,K) / PSPLT(J,K)
      DC 155 MNK=6,10
      PGBD(I,J,MNK) = PGBD(I,J,MNK) * TEM
      PGMC(I,J,MNK) = PGMC(I,J,MNK) * TEM
      PPBF(I,J,MNK) = PPBF(I,J,MNK) * TEM
      PPTC(I,J,MNK) = PPTC(I,J,MNK) * TEM
      PPMC(I,J,MNK) = PPMC(I,J,MNK) * TEM
  155 CCNTINUE
  156 K = K + I
      IF(PSPLT(J,K) .EO. 0.0) GD TO 158
      TEM = PARTY(J,K) / PSPLT(J,K)
      DD 157 MNK=I1,I4
      PGBD(I,J,MNK) = PGBD(I,J,MNK) * TEM
      PGMC(I,J,MNK) = PGMC(I,J,MNK) * TEM
      PPBF(I,J,MNK) = PPBF(I,J,MNK) * TEM
      PPTC(I,J,MNK) = PPTC(I,J,MNK) * TEM
      PPMC(I,J,MNK) = PPMC(I,J,MNK) * TEM
  157 CCNTINUE
  15B K = K + 1
      IF(PSPLT(J,K) .EQ. 0.0) GD TD I59
      TEM = PARTY(J,K) / PSPLT(J,K)
      PGBD(I,J,15) = PGBU(I,J,15) * TEM
      PGMC(I,J,15) = PGMC(I,J,15) * TEM
      PPBF(I,J,I5) = PPBF(I,J,15) * TEM
      PPTC(I,J,15) = PPTC(I,J,15) * TEM
      PPMC(I,J,15) = PPMC(I,J,15) * TEM
  159 CCNTINUE
      OC 165 I=1,NWGP
      DC 165 J=1,NBK
      CC 165 K=I,I5
      GRBO(I,J,K) = GRBD(I,J,K) + PGBO(I,J,K)
      GRMC(I,J,K) = GRMC(I,J,K) + PGMC(I,J,K)
      PTBF(I,J,K) = PTBF(I,J,K) + PPBF(I,J,K)
      PTCU(I,J,K) = PTCU(I,J,K) + PPTC(I,J,K)
      PTMC(I,J,K) = PTMC(I,J,K) + PPMC(I,J,K)
  165 CCNTINUE
C
C COMPUTE TOTAL VOLUMES BY BLOCK AND TYPE.
C
      OC I74 I=1,NWGP
      DD 174 J=1,NBK
      K = 1
      IF(I .EC. 2) K = 6
      DO 170 MNK=1,3
      BFTB(J,K) = BFTB(J,K) + PTBF(I,J,MNK)
      CFTB(J,K) = CFTB(J,K) + PTCU(I,J,MNK)
  170 CMTB(J,K) = CMTB(J,K) + PTMC(I,J,MNK)
      K = K + 1
```

```
      DO 171 MNK=4,5
      BFTB(J,K) = BFTB(J,K) + PTBF(I,J,MNK)
      CFTB(J,K) = CFTB(J,K) + PTCU(I,J,MNK)
  171 CMTB(J,K) = CMTB(J,K) + PTMC(I,J,MNK)
      K = K + 1
      DO 172 MNK=6,10
      BFTB(J,K) = BFTB(J,K) + PTBF(I,J,MNK)
      CFTB(J,K) = CFTB(J,K) + PTCU(I,J,MNK)
  172 CMTB(J,K) = CMTB(J,K) + PTMC(I,J,MNK)
      K = K + 1
      DO 173 MNK=11,14
      BFTB(J,K) = BFTB(J,K) + PTBF(I,J,MNK)
      CFTB(J,K) = CFTB(J,K) + PTCU(I,J,MNK)
  173 CMTB(J,K) = CMTB(J,K) + PTMC(I,J,MNK)
      K = K + 1
      BFTB(J,K) = BFTB(J,K) + PTBF(I,J,15)
      CFTB(J,K) = CFTB(J,K) + PTCU(I,J,15)
      CMTB(J,K) = CMTB(J,K) + PTMC(I,J,15)
  174 CONTINUE
C
C COMPUTE TOTAL VOLUMES BY WORKING GROUP AND AGE CLASS.
C
      DO 180 I=1,NWGP
      DO 180 J=1,NBK
      DO 180 K=1,15
      ABFAG(I,K) = ABFAG(I,K) + PTBF(I,J,K)
  180 AMCAG(I,K) = AMCAG(I,K) + PTMC(I,J,K)
C
C CONVERT WORK TOTALS TO AREAS AND VOLUMES BY BLOCK AND TYPE.
C
      DO 185 I=1,NBK
      DO 185 J=1,12
      IF(PSPLT(I,J) .EQ. 0.0) GO TO 185
      TEM = PARTY(I,J) / PSPLT(I,J)
      PBFT(I,J) = PBFT(I,J) * TEM
      PCMT(I,J) = PCMT(I,J) * TEM
      PCTA(I,J) = PCTA(I,J) * TEM
      PCTB(I,J) = PCTB(I,J) * TEM
      PHLP(I,J) = PHLP(I,J) * TEM
      POPN(I,J) = POPN(I,J) * TEM
      PPFN(I,J) = PPFN(I,J) * TEM
      PPCR(I,J) = PPCR(I,J) * TEM
      PSLV(I,J) = PSLV(I,J) * TEM
      PUNC(I,J) = PUNC(I,J) * TEM
  185 CONTINUE
C
C COMPUTE TOTAL VOLUMES OF BLOCKS AND WORKING CIRCLE.
C
      DO 186 I=1,NBK
      DO 186 J=1,12
      BFTH(I,J) = BFTH(I,J) + PBFT(I,J)
      CMTH(I,J) = CMTH(I,J) + PCMT(I,J)
      CUTA(I,J) = CUTA(I,J) + PCTA(I,J)
      CUTB(I,J) = CUTB(I,J) + PCTB(I,J)
      HELP(I,J) = HELP(I,J) + PHLP(I,J)
      OPEN(I,J) = OPEN(I,J) + POPN(I,J)
      PCCFN(I,J) = PCCFN(I,J) + PPFN(I,J)
      PCCFR(I,J) = PCCFR(I,J) + PPCR(I,J)
      SLVG(I,J) = SLVG(I,J) + PSLV(I,J)
      UNCML(I,J) = UNCML(I,J) + PUNC(I,J)
  186 CONTINUE
      DO 190 I=1,NBK
      DO 190 J=1,12
      BFBLK(I) = BFBLK(I) + BFTB(I,J)
      CFMER(I) = CFMER(I) + CMTB(I,J)
      SSPT = SSPT + SPLT(I,J)
      SUNC = SUNC + UNCML(I,J)
      TMPO = TMPO + SARETY(I,J)
  190 TCF(I) = TCF(I) + CFTB(I,J)
      DO 200 I=1,NBK
      DO 200 J=1,10
  200 TMBR = SARETY(I,J) + TMBR
      DO 210 I=1,NBK
      SBOF = SBOF + BFBLK(I)
      SCFM = SCFM + CFMER(I)
  210 STCF = STCF + TCF(I)
C
C COMPUTE BLOCK VOLUMES BY WORKING GROUP.
C
      DO 220 I=1,NBK
      DO 220 J=1,5
      K = J + 5
      BFSP(1,I) = BFSP(1,I) + BFTB(I,J)
      BFSP(2,I) = BFSP(2,I) + BFTB(I,K)
      CMSP(1,I) = CMSP(1,I) + CMTB(I,J)
      CMSP(2,I) = CMSP(2,I) + CMTB(I,K)
      TCSP(1,I) = TCSP(1,I) + CFTB(I,J)
  220 TCSP(2,I) = TCSP(2,I) + CFTB(I,K)
C
C COMPUTE VOLUMES BY WORKING GROUP.
C
      DO 230 I=1,NWGP
      DO 230 J=1,NBK
      SBF(I) = SBF(I) + BFSP(I,J)
      SMC(I) = SMC(I) + CMSP(I,J)
  230 STC(I) = STC(I) + TCSP(I,J)
      DO 238 I=1,NBK
  238 PABR(I) = PARTY(I,11) + PARTY(I,12)
C
C SUM ACRES BY WORKING GROUP, BLOCK, AND SITE CLASS.
C
      DO 240 I=1,NBK
      TEM = PSPLT(I,11) + PSPLT(I,12)
      IF(TEM .EQ. 0.0) GO TO 240
      DO 239 J=1,10
      PBRSI(I,J) = PBRSI(I,J) * (PABR(I) / TEM)
  239 CONTINUE
  240 CONTINUE
      DO 241 I=1,NBK
      DO 241 J=1,10
  241 BARSI(1,J) = BARSI(1,J) + PBRSI(I,J)
      DO 250 I=1,NBK
      DO 250 J=1,5
      K = J + 5
      TPB(1,I) = TPB(1,I) + PSPLT(I,J)
  250 TPB(2,I) = TPB(2,I) + PSPLT(I,K)
C
C COMPUTE AREAS BY WORKING GROUP, BLOCK, AND SITE CLASS.
C
      IF(TMBR .EQ. 0.0) GO TO 299
      DO 261 I=1,NBK
      DO 261 J=1,10
      IF(TPB(1,I) .EQ. 0.0) GO TO 260
      PASI(1,I,J) = PASP(1,I) * PS(1,I,J) / TPB(1,I)
  260 IF(TPB(2,I) .EQ. 0.0) GO TO 261
      PASI(2,I,J) = PASP(2,I) * PS(2,I,J) / TPB(2,I)
  261 CONTINUE
      DO 262 I=1,NWGP
      DO 262 J=1,5
      DO 262 K=1,10
  262 ACSI(I,J,K) = ACSI(I,J,K) + PASI(I,J,K)
C
C COMPUTE AREAS BY COMBINATIONS OF WORKING GROUP, BLOCK, AND AGE.
C
      DO 271 I=1,NWGP
      DO 270 J=1,NBK
      DO 270 K=1,15
      IF(TPB(I,J) .EQ. 0.0) GO TO 270
      PAFN(I,J,K) = PASP(I,J) * PAFN(I,J,K) / TPB(I,J)
      PARG(I,J,K) = PASP(I,J) * PARG(I,J,K) / TPB(I,J)
  270 CONTINUE
  271 CONTINUE
      DO 272 I=1,NWGP
      DO 272 J=1,NBK
      DO 272 K=1,15
      ACFNL(I,J,K) = ACFNL(I,J,K) + PAFN(I,J,K)
  272 ACRGN(I,J,K) = ACRGN(I,J,K) + PARG(I,J,K)
C
C COMPUTE PERIODIC ANNUAL INCREMENT.
C
      DO 280 I=1,NWGP
      DO 280 J=1,NBK
      DO 280 K=1,15
      PA1BO(I) = GRBO(I,J,K) + PA1BO(I)
      PAICU(I) = GRMC(I,J,K) + PAICU(I)
  280 CONTINUE
      DO 281 I=1,NWGP
      IF(TIME .EQ. 0.0) GO TO 281
      PAIBO(I) = PAIBO(I) / TIME
      PAICU(I) = PAICU(I) / TIME
  281 CONTINUE
C
C PRINT PAGE TYPE 7 - WORKING GROUP AND BLOCK VOLUMES.
C
  299 WRITE (6,300)
  300 FORMAT (1H1,////,60X,11HPAGE TYPE 7)
      WRITE (6,301)
  301 FORMAT (1H0,//,47X,36HVOLUMES OF BLOCKS AND WORKING CIRCLE)
      WRITE (6,302) (FORET(I),I=1,3)
  302 FORMAT (1H ,54X,3A8)
      WRITE (6,303)
  303 FORMAT (1H0,//,13X,24HTOTAL PINE WORKING GROUP,17X,26HTOTAL SPRUCE
     1 WORKING GROUP,19X,21HTOTAL VOLUME OF BLOCK)
      WRITE (6,304)
  304 FORMAT (1H ,5HBLOCK,3X,5HTOTAL,8X,6HMERCH.,11X,1HM,11X,5HTOTAL,8X,
     16HMERCH.,11X,1HM,11X,5HTOTAL,8X,6HMERCH.,11X,1HM)
      WRITE (6,305)
  305 FORMAT (1H ,1X,3HNO.,3X,7HCU. FT.,7X,7HCU. FT.,7X,7HBO. FT.,7X,7HC
     1U. FT.,7X,7HCU. FT.,7X,7HBO. FT.,7X,7HCU. FT.,7X,7HCU. FT.,7X,7HBO
     2. FT.,//)
      DO 307 I=1,NBK
      WRITE (6,306) I,TCSP(1,I),CMSP(1,I),BFSP(1,I),TCSP(2,I),CMSP(2,I),
     1BFSP(2,I),TCF(I),CFMER(I),BFBLK(I)
  306 FORMAT (1H0,1X,I2,1X,8(F11.1,3X),F11.1)
  307 CONTINUE
      WRITE (6,308) STC(1),SMC(1),SBF(1),STC(2),SMC(2),SBF(2),STCF,SCFM,
     1SBOF
  308 FORMAT (1H0,//,1X,4HSUMS,8(F11.1,3X),F11.1,//////)
      WRITE (6,309)
  309 FORMAT(1H0,10X,47HCUBIC FEET IN HUNDREDS, BOARD FEET IN THOUSANDS)
C
C PRINT PAGE TYPE 8 - TYPE AREAS AND VOLUMES.
C
      WRITE (6,319)
  319 FORMAT (1H1,//,60X,11HPAGE TYPE 8)
      WRITE (6,320)
  320 FORMAT (1H0,/,39X,52HTOTAL AREAS AND VOLUMES OF BLOCKS AND WORKING
     1 CIRCLE)
      WRITE (6,302) (FORET(I),I=1,3)
      WRITE (6,321)
  321 FORMAT (1H0,5HBLOCK,7X,4HTYPE,12X,5HTOTAL,12X,5HTOTAL,12X,6HMERCH.
     1,13X,1HM,13X,5HACRES,11X,6HNUMBER)
      WRITE (6,322)
  322 FORMAT (1H ,1X,3HNO.,9X,3HNO.,12X,5HACRES,11X,7HCU. FT.,11X,7HCU.
     1FT.,9X,7HBO. FT.,9X,8HLOW SITE,7X,10HOF RECORDS,//)
      DO 325 I=1,NBK
      DO 325 J=1,12
      WRITE (6,323) I,J,SARETY(I,J),CFTB(I,J),CMTB(I,J),BFTB(I,J),UNCML(
     1I,J),SPLT(I,J)
  323 FORMAT (1H ,1X,I2,10X,I2,9X,5(F11.1,6X),F6.0)
      IF(J .LT. 12) GO TO 325
      WRITE (6,324)
  324 FORMAT (1H0)
  325 CONTINUE
      WRITE (6,326) TMPO,STCF,SCFM,SBOF,SUNC,SSPT
  326 FORMAT (1H0,6HTOTALS,18X,5(F11.1,6X),F6.0)
      WRITE (6,309)
C
```

```
C PRINT PAGE TYPE 9 - AREAS BY SITE INDEX CLASS.
C
      WRITE (6,329)
  329 FORMAT (1H1,////,60X,11HPAGE TYPE 9)
      WRITE (6,330)
  330 FORMAT (1H0,/,46X,40HDISTRIBUTION OF AREA BY SITE INDEX CLASS)
      WRITE (6,302) (FORET(I),I=1,3)
      WRITE (6,331)
  331 FORMAT (1H0,//,10X,5HBLOCK,16X,10HSITE INDEX,10X,13HACRES OF PINE,
     110X,15HACRES OF SPRUCE,10X,10HDEFORESTED/1H ,44X,13HWORKING GROUP,
     211X,13HWORKING GROUP,14X,5HACRES,//)
      DO 333 I=1,NBK
      DO 333 J=1,10
      MNK = J * 10
      WRITE (6,332) I,MNK,ACSI(1,I,J),ACSI(2,I,J),BARSI(I,J)
  332 FORMAT (1H ,10X,I2,16X,I3,14X,F10.1,14X,F10.1,12X,F10.1)
      IF(MNK .LT. 100) GO TO 333
      WRITE (6,324)
  333 CONTINUE
      WRITE (6,334) SMSP(1),SMSP(2),SBARE
  334 FORMAT (1H0,//,10X,5HTOTAL,29X,F12.1,12X,F12.1,10X,F12.1)
      RETURN
      END
       SUBROUTINE GOAL
C
C TO COMPUTE GROWING STOCK NEEDED TO MEET MANAGEMENT OBJECTIVES.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,DATE(3),DLEV(3),FINL(3),FORET(3),GRBD(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),PGOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SDARB,SBARE,SBARG,SBF(3),SHELT(3),SHWD(3),S
     7LAND,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPD,TYPNM(20),DELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,PDCFR(5,12),PDCFN(5,12),DPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBC(3),BFINT(3),DPBO(3),TEM,MNK,KND,FCTR(2),PRCO(2),KAK,VOM(2)
     2,ADJ(3),ALDWC(3),ALWBF(3),BDMAI(3),CUMAI(3),PAIBO(3),PAICU(3),DBHO
     3,GEND,REST,DBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      DIMENSION ANDDF(151),ANCUV(151),BDFC(150),BDFG(150),BFS(15),CFMC(1
     150),CFMD(150),CMS(15),EQIV(10),EQVCF(10),FACCF(10),FAC(10),QUAL(10
     2),STACF(10),STDAC(10),VLBF(10),VLCU(10),PDCUT(16)
C
C ASSIGN PART OF DEFORESTED AREA TO EACH WORKING GROUP.
C
      DO 2 I=1,NBK
      TEM = ACSP(1,I) + ACSP(2,I)
      IF(TEM .EQ. 0.0) GO TO 2
      FONE = ACSP(1,I) / TEM
      FTWO = ACSP(2,I) / TEM
      DO 1 J=1,10
      ACSI(1,I,J) = ACSI(1,I,J) + BARSI(I,J) * FONE
      ACSI(2,I,J) = ACSI(2,I,J) + BARSI(I,J) * FTWO
    1 CONTINUE
    2 CONTINUE
C
C COUNT NUMBER OF SITE CLASSES FOR EACH WORKING GROUP.
C
      DO 21 I=1,NWGP
      DO 10 J=1,NBK
      IF(ACSI(I,J,10) .GT. 0.0) GO TO 15
   10 CONTINUE
      DO 11 J=1,NBK
      IF(ACSI(I,J,9) .GT. 0.0) GO TO 16
   11 CONTINUE
      DO 12 J=1,NBK
      IF(ACSI(I,J,8) .GT. 0.0) GO TO 17
   12 CONTINUE
      DO 13 J=1,NBK
      IF(ACSI(I,J,7) .GT. 0.0) GO TO 18
   13 CONTINUE
      DO 14 J=1,NBK
      IF(ACSI(I,J,6) .GT. 0.0) GO TO 19
   14 CONTINUE
      GO TO 20
   15 NSI(I) = 11.0 - POOR(I) * 0.1
      GO TO 21
   16 NSI(I) = 10.0 - POOR(I) * 0.1
      GO TO 21
   17 NSI(I) = 9.0 - POOR(I) * 0.1
      GO TO 21
   18 NSI(I) = 8.0 - POOR(I) * 0.1
      GO TO 21
   19 NSI(I) = 7.0 - POOR(I) * 0.1
      GO TO 21
   20 NSI(I) = 3
   21 CONTINUE
      DO 25 I=1,NWGP
      DO 25 J=1,NBK
      DO 25 K=1,10
   25 SARSP(I) = SARSP(I) + ACSI(I,J,K)
C
C DO REMAINDER OF SUBROUTINE ONCE FOR EACH WORKING GROUP.
C
      DO 400 KAK=1,NWGP
      DO 35 I=1,NBK
      DO 35 J=1,10
   35 AREA(KAK,J) = AREA(KAK,J) + ACSI(KAK,I,J)
C
C ZERO VARIABLES COMMON TO ALL SITES.
C
      SACCF = 0.0
      SSTAC = 0.0
      DO 40 I=1,10
      EQIV(I) = 0.0
      EQVCF(I) = 0.0
      FACCF(I) = 0.0
      FAC(I) = 0.0
      QUAL(I) = 0.0
      STACF(I) = 0.0
      STDAC(I) = 0.0
      VLBF(I) = 0.0
   40 VLCU(I) = 0.0
C
C COMPUTE LOOP INDEXES FOR NUMBER OF SITE CLASSES INCLUDED IN GOALS.
C
      SITE = POOR(KAK)
      KSI = POOR(KAK) * 0.1
      KNO = KSI + NSI(KAK) - 1
      IF(KNO .GT. 10) KNO = 10
C
C ENTER FOLLOWING LOOP ONCE FOR EACH SITE CLASS OF A WORKING GROUP.
C
      DO 253 KAN=KSI,KNO
      QUAL(KAN) = SITE
C
C READ INITIAL STAND CONDITIONS, ONE SET OF CARDS PER WORKING GROUP.
C FIRST CARD IS FOR SITE POOR(KAK). PROVIDE MORE THAN NSI CARDS FOR EACH
C WORKING GROUP SO NO SITE CLASS IS UNDEFINED.
C
      READ (5,45) AGED,DENO,DBHO
   45 FORMAT (3F5.1)
      IF(AGED .EQ. 0.0 .OR. AGED .GT. ROTA) GO TO 261
      IF(AREA(KAK,KAN) .EQ. 0.0) GO TO 252
C
C INITIALIZE VARIABLES RECOMPUTED FOR EACH SITE CLASS.
C
      ACTEM = 0.0
      ACGHT = 0.0
      BCAI = 0.0
      BCFT = 0.0
      BFTEM = 0.0
      CFAI = 0.0
      CFMT = 0.0
      CFTEM = 0.0
      HTCUM = 0.0
      JBCFC = 0
      JBDFD = 0
      JPDFT = 0
      JCFMC = 0
      JCFMG = 0
      JCFMT = 0
      DO 50 I=1,15
      BFS(I) = 0.0
   50 CMS(I) = 0.0
      DO 51 I=1,150
      BCFC(I) = 0.0
      BCFO(I) = 0.0
      CFMC(I) = 0.0
   51 CFMO(I) = 0.0
      DO 52 I=1,151
      ANBDF(I) = 0.0
   52 ANCUV(I) = 0.0
      DO 53 I=1,16
   53 PGCUT(I) = 0.0
      N1 = AGED
      N = AGED
C
C OBTAIN HTSO AND TOTAL CU. FT. PER ACRE.
C
      BASO = GENO * 0.0054542 * DBHO * DBHO
      IF(KAK .EQ. 2) GO TO 57
      IF(AGED .GT. 55.0) GO TO 54
      HTSO = 0.01441 * AGED * SITE - 0.12162 * AGED - 1.50953
      GO TO 55
   54 HTSO = 0.59947 - 61.5019 / AGED + 0.80522 * ALOG10(SITE) + 20.5252
     18 * ALOG10(SITE) / AGED
      HTSO = 10.0 ** HTSO
   55 D2H = DBHO * DBHO * HTSO
      IF(D2H .GT. 6000.0) GO TO 56
      TOTO = (0.00225 * D2H - 0.00074 * BASO + 0.03711) * DENO
      GO TO 61
   56 TOTO = (0.00247 * D2H + 0.00130 * BASO - 1.40286) * DENO
      GO TO 61
   57 IF(AGED .GT. 45.0) GO TO 58
      HTSO = 3.86111 - 0.05979 * AGED + 0.01215 * AGED * SITE
      GO TO 59
   58 HTSO = 0.33401 - 33.2866 / AGED + 0.92341 * ALOG10(SITE) + 6.27811
     1* ALOG10(SITE) / AGED
      HTSO = 10.0 ** HTSO
   59 TOTO = 0.50 * BASO * HTSO + 16.96
C
C CONVERT TOTAL CU. FT. TO OTHER UNITS.
C
   61 IF(DBHO .LT. 5.0) GO TO 74
      KNO = 1
      BA(1) = BASO
      VOM(1) = DBHO
      CALL VOLS
      BGFO(N) = TOTO * PROD(1)
      CFMO(N) = TOTO * FCTR(1)
C
C COMPUTE D.B.H. AFTER INITIAL THINNING.
C
   74 REST = THIN(KAK)
      CALL CUTS
C
C ENTER LOOP FOR ALL REMAINING COMPUTATIONS AND PRINTOUT.
C
      DO 184 I=1,100
      JGENT = (BAST / (0.0054542 * DBHT * DBHT)) + 0.5
      DENT = JGENT
      BAST = 0.0054542 * DBHT * DBHT * DENT
      IF(KAK .EQ. 2) GO TO 94
      AGDHT = 7.64833 - 3.82286 * ALOG10(PRET)
      HTCUM = HTCUM + AGDHT
      HTST = HTSO + AGDHT
      D2H = DBHT * DBHT * HTST
```

```
      IF(02H .GT. 60C0.0) GO TO 80
      TOTT = (0.00225 * 02H - 0.CCC74 * BAST + C.03711) * OENT
      GC TO 100
   80 TCTT = (0.00247 * 02H + 0.0C130 * BAST - 1.40286) * OENT
      GC TO 1C0
   94 HTST = HTSO
      TCTT = 0.50 * BAST * HTST + 16.96
C
C CONVERT TOTAL CU. FT. TO OTHER UNITS.
C
  100 IF(OBHT .LT. 5.0) GO TO 120
      KNO = 1
      BA(1) = BAST
      VCM(1) = OBHT
      CALL VOLS
      BCFT = TOTT * PROO(1)
      CFMT = TOTT * FCTR(1)
C
C CHANGE MOOE ANO ROUNO OFF FOR PRINTING.
C
  120 JCENO = CENO + 0.5
      JHTSO = HTSO + 0.5
      JTOTO = TOTO + 0.5
      JBASO = BASO + 0.5
      JCFMO = CFMO(N) + 0.5
      JBOFO = BOFO(N) * 0.1 + 0.5
      JBOFO = JBCFO * 10
      JCENT = CENT + 0.5
      JHTST = HTST + 0.5
      JTOTT = TOTT + 0.5
      JCENC = JOENO - JOENT
      JCFMT = CFMT + 0.5
      CFMT = JCFMT
      IF(JCFMT .GT. JCFMO) JCFMO = JCFMT
      CFMO(N) = JCFMO
      JBOFT = BOFT * 0.1 + C.5
      JBCFT = JBCFT * 10
      BCFT = JBOFT
      BCFT = BCFT * .001
      IF(JBOFT .GT. JBOFO) JBOFO = JBOFT
      BCFO(N) = JBOFO
      BOFO(N) = BOFO(N) * .001
      JBAST = BAST + 0.5
      JBASC = JBASO - JBAST
      JTOTC = JTOTO - JTOTT
      JCFMC = JCFMO - JCFMT
      IF(JCFMC .LE. 0) JCFMC = 0
      CFMC(N) = JCFMC
      JBCFC = JBCFO - JBOFT
      IF(JBOFC .LE. 0) JBOFC = 0
      BOFC(N) = JBOFC
      BOFC(N) = BOFC(N) * .C01
      IF(1 .GE. 2) GO TO 139
C
C PRINT PAGE TYPE 10 - YIELO TABLE FOR EACH WORKING GROUP ANO SITE.
C
C WRITE HEAOINGS FOR YIELO TABLE.
C
      WRITE (6,129)
  129 FORMAT (1H1,//,62X,12HPAGE TYPE 10)
      WRITE (6,130) QUAL(KAN),CYCL,OLEV(KAK)
  130 FORMAT (1H0,//,28X,81HYIELOS PER ACRF OF MANAGFO, EVEN-AGEO STANOS
     1 BASEO ON PREOETERMINEO STANOAROS FOR/1H ,35X,10HSITE INOEX,F5.0,1
     2H,,F5.0,19H-YEAR CUTTING CYCLE,1H,,15H OENSITY LEVEL ,F4.0)
      IF(KAK .EQ. 2) GO TO 132
      WRITE (6,131)
  131 FCRMAT (1H0,56X,20HWORKING GROUP - PINE,/)
      GC TO 134
  132 WRITE (6,133)
  133 FORMAT (1H0,55X,22HWORKING GROUP - SPRUCF,/)
  134 WRITE (6,135)
  135 FCRMAT (1H0,25X,38HENTIRE STANO BEFORE ANO AFTER THINNING,28X,26HP
     1ERIOOIC CUT ANO MORTALITY)
      WRITE (6,136)
  136 FCRMAT (1H0,9X,5HSTANO,10X,5HBASAL,3X,7HAVERAGE,2X,7HAVERAGE,3X,5H
     1TOTAL,3X,9HMERCHANT-,3X,9HSAWTIMBER,9X,5HBASAL,4X,5HTCTAL,3X,9HMER
     2CHANT-,3X,9HSAWTIMBER)
      WRITE (6,137)
  137 FORMAT (1H ,10X,3HAGE,4X,5HTREES,3X,4HAREA,4X,6HO.B.H.,3X,6HHEIGHT
     1,2X,6HVOLUME,2X,11HABLE VOLUME,4X,6HVOLUME,3X,5HTREFS,3X,4HAREA,3X
     2,6HVCLUME,2X,11HABLE VOLUME,4X,6HVOLUME)
      WRITE (6,138)
  138 FORMAT (1H ,8X,7H(YEARS),3X,3HNO.,2X,7HSQ. FT.,4X,3HIN.,6X,3HFT.,4
     1X,7HCU. FT.,3X,7HCU. FT.,4X,9HM BO. FT.,3X,3HNO.,2X,7HSQ. FT.,2X,7
     2HCU. FT.,3X,7HCU. FT.,4X,9HM BO. FT.)
  139 WRITE (6,140) AGEO,JOENO,JBASO,OBHO,JHTSO,JTOTO,CFMO(N),BOFO(N)
  140 FCRMAT (1H0,9X,F4.0,4X,I5,2X,I4,5X,F5.1,5X,I3,4X,I5,5X,F6.0,6X,F6.
     13)
      IF(AGEO .GE. ROTA) GO TO 185
      WRITE (6,141) AGEO,JOENT,JBAST,OBHT,JHTST,JTOTT,CFMT,BOFT,JOENC,JB
     1ASC,JTOTC,CFMC(N),BOFC(N)
  141 FORMAT (1H ,9X,F4.0,4X,I5,2X,I4,5X,F5.1,5X,I3,4X,I5,5X,F6.0,6X,F6.
     13,4X,I5,3X,I3,5X,I4,5X,F5.0,8X,F5.3)
C
C COMPUTE VALUES FOR EACH PERIOO. THIN AS SPECIFIEO.
C
      IK = CYCL / RINT
      OO 163 L=1,IK
      AGEO = AGEO + RINT
      N = AGEO
      IF(AGEO .GT. ROTA) GO TO 185
      IF(KAK .EQ. 2) GO TO 146
      OBHO = 1.0097*OBHT + 0.0096*SITE - 1.5766*ALOG10(BAST) + 3.3021
      GC TO 147
  146 OBHO = 1.0222*OBHT + C.0151*SITE - 1.2417*ALOG10(BAST) + 2.1450
  147 MNK = OBHO * 10.0 + 0.5
      OBHO = MNK
      OBHO = OBHO * 0.1
C
C REOUCE FUTURE OENSITY BY AMOUNT OF PREOICTEO MORTALITY.
C
      IF(OBHT .GE. 1C.0) GC TO 152
      IF(KAK .EQ. 2) GC TO 149
      CENO = 0.C0247 + 0.00124 * OBHT + 0.0C028 * OBHT * OBHT + 0.000005
     121 * BAST * BAST - C.CCC0905 * OBHT * BAST
      GC TO 15C
  149 OENO = 0.05285 - 0.01346 * OBHT + 0.00226 * OBHT * OBHT + 0.000006
     16 * BAST * BAST - 0.CC01931 * OBHT * BAST
  15C IF(OENO .LT. 0.0) OENO = C.C
      MNK = CENT * (1.0 - CENO) + 0.5
      OENO = MNK
      GC TC 153
  152 CENO = CENT
  153 BASO = OENO * 0.0054542 * OBHO * OBHO
C
C CCMPUTE HTSO FROM AGE ANO SITE INOEX.
C
      IF(KAK .EQ. 2) GO TO 157
      IF(AGEC .GT. 55.0) GO TO 154
      HTSO = 0.01441 * AGEO * SITE - 0.12162 * AGEO - 1.50593
      GC TO 155
  154 HTSO = 0.59947 - 61.5019 / AGEO + 0.80522 * ALOG10(SITE) + 20.5252
     18 * ALOG10(SITE) / AGEO
      HTSO = 10.0 ** HTSO
  155 HTSO = HTSC + HTCUM
      02H = OBHO * OBHO * HTSO
      IF(02H .GT. 6000.0) GO TC 156
      TCTO = (0.00225 * 02H - 0.0CC74 * BASC + C.03711) * OENO
      GC TO 160
  156 TOTO = (0.C0247 * 02H + 0.00130 * BASC - 1.40286) * OENO
      GC TO 160
  157 IF(AGEO .GT. 45.0) GO TO 158
      HTSO = 3.86111 - 0.05979 * AGEO + C.01215 * AGEO * SITE
      GC TO 159
  158 HTSO = 0.33401 - 33.2866 / AGEO + 0.92341 * ALOG10(SITE) + 6.27811
     1* ALOG10(SITE) / AGEO
      HTSO = 1C.0 ** HTSO
  159 TCTO = 0.50 * BASO * HTSO + 16.96
C
C CONVERT TOTAL CU. FT. TO OTHER UNITS.
C
  160 IF(OBHO .LT. 5.0) GO TO 161
      KNO = 1
      BA(1) = BASO
      VCM(1) = OBHO
      CALL VOLS
      BCFO(N) = TOTO * PROO(1)
      CFMO(N) = TOTO * FCTR(1)
  161 IF(L .EQ. IK) GO TO 165
C
C WRITE VALUES FOR ENO OF PERIOO IF THINNING NCT OUE.
C
      KCENC = CENO + 0.5
      KHTSO = HTSO + 0.5
      KBASO = BASO + 0.5
      KTCTO = TCTO + 0.5
      JCFMO = CFMO(N) + 0.5
      CFMO(N) = JCFMO
      JBCFO = BOFO(N) * 0.1 + 0.5
      JBCFO = JBOFO * 10
      BCFO(N) = JBOFO
      BOFO(N) = BOFO(N) * .C01
      WRITE (6,140) AGEO,KOENO,KBASO,OBHO,KHTSO,KTOTO,CFMO(N),BOFO(N)
      OBHT = CBHO
      BAST = BASO
      OFNT = CENO
  163 CCNTINUE
C
C INCREASE O.B.H. BY THINNING ANO COMPUTE POST-THINNING VALUES.
C
  165 REST = CLEV(KAK)
      CALL CUTS
  184 CCNTINUE
  185 IROT = ROTA
      MNK = RINT
      NVOL = ((IROT - N1)/MNK) + 1
      K = NVOL - 1
C
C INTERPOLATE BETWEEN VALUES FROM YIELO TABLE.
C
      OO 186 L=1,K
      OC 186 J=1,MNK
      NN = J + N1 + (L - 1) * MNK
      TEM = J - 1
      N = N1 + (L - 1) * MNK
      ANCUV(NN)=CFMO(N)-CFMC(N)+(TEM/RINT)*(CFMO(N+MNK)-CFMO(N)+CFMC(N))
      ANBOF(NN)=BOFO(N)-BOFC(N)+(TEM/RINT)*(BOFC(N+MNK)-BOFO(N)+BOFC(N))
  186 CONTINUE
C
C PRINT PAGE TYPE 11 - ANNUAL VOLUMES PER ACRE.
C
C WRITE TABLE HEAOINGS.
C
      WRITE (6,189)
  189 FORMAT (1H1,//,61X,12HPAGE TYPE 11)
      WRITE (6,190) QUAL(KAN),CYCL,THIN(KAK),OLEV(KAK)
  190 FORMAT (1H0,41X,53HGROWING STOCK OF MANAGEO, REGULATEO, EVEN-AGEO
     1STANOS/1H ,47X,10HSITE INOEX,F5.0,1H,,F5.0,19H-YEAR CUTTING CYCLE/
     21H ,53X,14HOENSITY LEVEL-,F5.0,1X,3HANO,F5.0)
      IF(KAK .EQ. 2) GO TO 191
      WRITE (6,131)
      GO TO 192
  191 WRITE (6,133)
  192 WRITE (6,193)
  193 FORMAT (1H0,43X,44HVOLUMES PRESENT PER ACRE AT ENO OF EACH YEAR,/)
      WRITE (6,194)
  194 FORMAT (1H0,54X,23HMERCHANTABLE CUBIC FEET/1H0,64X,4HYEAR/1H ,14X,
     16HOECAOE,9X,1H0,9X,1H1,9X,1H2,9X,1H3,9X,1H4,9X,1H5,9X,1H6,9X,1H7,9
     2X,1H8,9X,1H9,//)
      K = 0
```

```
C
C WRITE CUBIC FEET PER ACRE FOR EACH YEAR.
C
      WRITE (6,195) K,(ANCUV(NN),NN=1,10)
  195 FORMAT (1H ,I20,F13.1,9F10.1)
      MNK = ROTA * 0.1 - 1.0
      DO 196 J=1,MNK
      NN = 10 * J + 1
      WRITE (6,195)J,ANCUV(NN),ANCUV(NN+1),ANCUV(NN+2),ANCUV(NN+3),ANCUV
     1(NN+4),ANCUV(NN+5),ANCUV(NN+6),ANCUV(NN+7),ANCUV(NN+8),ANCUV(NN+9)
  196 CONTINUE
      J = ROTA * 0.1
      ANCUV(IROT+1) = CFMD(IROT)
      WRITE (6,195) J,ANCUV(IROT+1)
C
C WRITE BOARD FEET PER ACRE FOR EACH YEAR.
C
      WRITE (6,197)
  197 FORMAT (1H0,///,55X,23HTHOUSANDS OF BOARD FEET,//)
      WRITE (6,198) K,(ANBDF(NN),NN=1,10)
  198 FORMAT (1H ,I20,F13.3,9F10.3)
      DO 199 J=1,MNK
      NN = 10 * J + 1
      WRITE (6,198)J,ANBDF(NN),ANBDF(NN+1),ANBDF(NN+2),ANBDF(NN+3),ANBDF
     1(NN+4),ANBDF(NN+5),ANBDF(NN+6),ANBDF(NN+7),ANBDF(NN+8),ANBDF(NN+9)
  199 CONTINUE
      J = ROTA * 0.1
      ANBDF(IRCT+1) = BDFO(IROT)
      WRITE (6,198) J,ANBDF(IROT+1)
C
C COMPUTE M.A.I. FOR EACH WORKING GROUP AND SITE CLASS.
C
      TEM = 0.0
      REM = 0.0
      MNK = RAGE(KAK,KAN) - DELAY(KAK)
      DO 200 I=1,MNK
      TEM = TEM + BDFC(I)
  200 REM = REM + CFMC(I)
      REM = REM * 0.01
      MNK = MNK + 1
      BDAI = ANBDF(MNK) + (SHELT(KAK)*GROWB(KAK)*0.01*FINL(KAK)) + TEM
      BDAI = BDAI / RAGE(KAK,KAN)
      CFAI = ANCUV(MNK) * 0.01 + (SHWD(KAK) * GROWC(KAK) * 0.01 * FINL(K
     1AK)) + REM
      CFAI = CFAI / RAGE(KAK,KAN)
      BDMAI(KAK) = BDMAI(KAK) + BDAI * AREA(KAK,KAN)
      CUMAI(KAK) = CUMAI(KAK) + CFAI * AREA(KAK,KAN)
C
C COMPUTE ACRES IN EACH AGE CLASS WITH IDEAL CONDITIONS.
C
      ANCUT(KAK,KAN) = AREA(KAK,KAN) / RAGE(KAK,KAN)
C
C CHANGE VALUE OF CLASS IF AGE CLASSES ARE NOT 10 YEARS.
C
      CLASS = 10.0
      TEM = ANCUT(KAK,KAN) * CLASS
      IF(DELAY(KAK) .EQ. 0.0) GO TO 204
      IF(SHWD(KAK) .GT. 0.0) GO TO 204
      PDCUT(1) = ANCUT(KAK,KAN) * DELAY(KAK)
      MNK = (RAGE(KAK,KAN) - DELAY(KAK) + 9.0) * 0.1
      IK = MNK + 1
      DO 202 I=2,MNK
  202 PDCUT(I) = TEM
      TEM = MNK - 1
      TEM = RAGE(KAK,KAN) - DELAY(KAK) - (CLASS * TEM)
      PDCUT(IK) = ANCUT(KAK,KAN) * TEM
      GO TO 206
  204 MNK = ((RAGE(KAK,KAN) + 9.0) * 0.1) + 1.0
      DO 205 I=2,MNK
  205 PDCUT(I) = TEM
C
C COMPUTE GROWING STOCK IN EACH AGE CLASS WITH IDEAL CONDITIONS.
C
  206 MAX = RAGE(KAK,KAN) - DELAY(KAK) + 1.0
      DO 210 I=1,MAX
      IF(ANBDF(I) .LT. BFMRCH) GO TO 210
      MID = I
      GO TO 211
  210 CONTINUE
  211 MES = MID - 1
      MUD = MIN + 1
      DO 212 J=MUD,MES
  212 SUBCF(KAK,KAN) = SUBCF(KAK,KAN) + ANCUV(J) * 0.01
      SUBCF(KAK,KAN) = SUBCF(KAK,KAN) * ANCUT(KAK,KAN)
      DO 213 K=MID,MAX
  213 CFBF(KAK,KAN) = CFBF(KAK,KAN) + ANCUV(K) * 0.01
      CFBF(KAK,KAN) = CFBF(KAK,KAN) * ANCUT(KAK,KAN)
      DO 215 I=1,15
      DO 214 J=2,11
      K = J + 10 * I - 10
      IF(K .GT. MAX) GO TO 217
      IF(K .LT. MUD) GO TO 214
      CMS(I) = CMS(I) + ANCUV(K) * 0.01
      IF(K .LT. MID) GO TO 214
      BFS(I) = BFS(I) + ANBDF(K)
  214 CONTINUE
  215 CONTINUE
C
C ADD SHELTERWOOD OR SEED TREES, IF ANY, TO OPTIMUM GROWING STOCK.
C PROVIDE FOR VOLUME GROWTH DURING REGENERATION PERIOD.
C
  217 IF(SHWD(KAK) .EQ. 0.0) GO TO 226
      K = (FINL(KAK) + 9.0) * 0.1
C
C CHANGE VALUE OF CLASS IF AGE CLASSES ARE NOT 10 YEARS.
C
      CLASS = 10.0
      REM = CLASS
      IF(FINL(KAK) .LT. CLASS) REM = FINL(KAK)
      IF(DELAY(KAK) .GT. 0.0) GO TO 220
      DO 219 NX=1,K
      TEM = NX
      IF(REM .GT. 0.0 .AND. REM .LT. CLASS) CLASS = REM
      DMY = 0.0
      MNK = (TEM - 1.0) * CLASS + 1.0
      KNM = CLASS * TEM
      DO 218 KU=MNK,KNM
      TMPY = KU
  218 DMY = DMY + TMPY
      BFS(NX) = BFS(NX) + SHELT(KAK) * CLASS + SHELT(KAK) * GROWB(KAK) *
     10.01 * DMY
      CMS(NX) = CMS(NX) + SHWD(KAK) * CLASS + SHWD(KAK) * GROWC(KAK) *
     10.01 * DMY
      REM = FINL(KAK) - CLASS * TEM
      IF(REM .LE. 0.0) GO TO 226
  219 CONTINUE
      GO TO 226
  220 J = (DELAY(KAK) + 9.0) * 0.1
      L = RAGE(KAK,KAN) * 0.1
      DO 225 I=1,K
      TEM = I
      IF(REM .GT. 0.0 .AND. REM .LT. CLASS) CLASS = REM
      DMY = 0.0
      MNK = (TEM - 1.0) * CLASS + 1.0
      KNM = CLASS * TEM
      DO 221 KU = MNK,KNM
      TMPY = KU
  221 DMY = DMY + TMPY
      IF(I .GT. J) GO TO 223
      NX = L + I - J
      GO TO 224
  223 NX = I-J
  224 BFS(NX) = BFS(NX) + SHELT(KAK) * CLASS + SHELT(KAK) * GROWB(KAK) *
     10.01 * DMY
      CMS(NX) = CMS(NX) + SHWD(KAK) * CLASS + SHWD(KAK) * GROWC(KAK) *
     10.01 * DMY
      REM = FINL(KAK) - CLASS * TEM
      IF(REM .LE. 0.0) GO TO 226
  225 CONTINUE
  226 DO 227 L=1,15
      BFS(L) = BFS(L) * ANCUT(KAK,KAN)
      CMS(L) = CMS(L) * ANCUT(KAK,KAN)
  227 CONTINUE
      DO 228 I=1,15
      ALLCF(KAK,KAN) = ALLCF(KAK,KAN) + CMS(I)
  228 SUBBF(KAK,KAN) = SUBBF(KAK,KAN) + BFS(I)
      GVLBF(KAK) = GVLBF(KAK) + SUBBF(KAK,KAN)
      GVLCU(KAK) = GVLCU(KAK) + SUBCF(KAK,KAN)
C
C COMPUTE POTENTIAL ANNUAL CUTS WITH BALANCED DISTRIBUTION OF AGE
C CLASSES AND OPTIMUM GROWING STOCK FOR OBJECTIVES.
C INTERMEDIATE, REGENERATION, AND FINAL CUTS KEPT SEPARATE HERE.
C
      MNK = RAGE(KAK,KAN) - DELAY(KAK) + 1.0
      TMPY = ANBDF(MNK) - SHELT(KAK)
      IF(TMPY .LT. COMBF(KAK)) GO TO 230
      DPBD(KAK) = DPBD(KAK) + TMPY * ANCUT(KAK,KAN)
      GO TO 231
  230 TEM = ANCUV(MNK) * 0.01 - SHWD(KAK)
      IF(TEM .LT. COMCU) GO TO 231
      DPCU(KAK) = DPCU(KAK) + TEM * ANCUT(KAK,KAN)
  231 IF(SHWD(KAK) .EQ. 0.0) GO TO 233
      TEM = SHELT(KAK) * (1.0 + FINL(KAK) * GROWB(KAK) * 0.01)
      IF(TEM .LT. COMBF(KAK)) GO TO 232
      FNBD(KAK) = FNBD(KAK) + TEM * ANCUT(KAK,KAN)
      GO TO 233
  232 TEM = SHWD(KAK) * (1.0 + FINL(KAK) * GROWC(KAK) * 0.01)
      IF(TEM .LT. COMCU) GO TO 233
      FNCU(KAK) = FNCU(KAK) + TEM * ANCUT(KAK,KAN)
  233 MNK = RAGE(KAK,KAN) - CYCL
      NR = CYCL
      DO 235 I=NI,MNK,NR
      ACTEM = ACTEM + 1.0
      IF(BDFC(I) .LT. COMBF(KAK)) GO TO 234
      BFTEM = BFTEM + BDFC(I)
      GO TO 235
  234 TEM = CFMC(I) * 0.01
      IF(TEM .LT. COMCU) GO TO 235
      CFTEM = CFTEM + TEM
  235 CONTINUE
      ACINT(KAK) = ACINT(KAK) + ACTEM * ANCUT(KAK,KAN)
      BFINT(KAK) = BFINT(KAK) + BFTEM * ANCUT(KAK,KAN)
      CUINT(KAK) = CUINT(KAK) + CFTEM * ANCUT(KAK,KAN)
C
C PRINT PAGE TYPE 12 - GROWING STOCK GOALS BY WORKING GROUP AND SITE.
C
      WRITE (6,236)
  236 FORMAT (1H1,//,58X,12HPAGE TYPE 12,/)
      WRITE (6,237) QUAL(KAN),RAGE(KAK,KAN),AREA(KAK,KAN)
  237 FORMAT (1H0,41X,44HDISTRIBUTION OF AREA AND GROWING STOCK GOALS/1H
     10,16X,21HFOR SITE INDEX CLASS-,F5.0,11H, ROTATION-,F5.0,5H, AND,F1
     20.1,35H ACRES OF THIS SITE CLASS AND GROUP)
      IF(KAK .EQ. 2) GO TO 238
      WRITE (6,131)
      GO TO 239
  238 WRITE (6,133)
  239 WRITE (6,240)
  240 FORMAT (1H0,44X,8HACRES IN,13X,11HHUNDREDS CF/1H ,23X,9HAGE CLASS,
     114X,5HCLASS,16X,7HCU. FT.,17X,9HM BD. FT.,/)
      IF(SHWD(KAK) .GT. 0.0) GO TO 242
      IF(DELAY(KAK) .EQ. 0.0) GO TO 242
      WRITE (6,241) PDCUT(1)
  241 FORMAT (1H0,27X,1H0,14X,F10.1)
  242 KNM = (RAGE(KAK,KAN) * 0.1) + 2.0
      DO 244 I=2,KNM
      J = I - 1
      MNK = 1 + 10 * I - 20
      IK = MNK + 9
      WRITE (6,243) MNK,IK,PDCUT(I),CMS(J),BFS(J)
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  243 FORMAT (1H0,24X,I3,1H-,I3,11X,F10.1,10X,F15.1,10X,F15.1)
  244 CONTINUE
      WRITE (6,245) AREA(KAK,KAN),ALLCF(KAK,KAN),SUBBF(KAK,KAN)
  245 FORMAT (1H0,//,26X,6HTOTALS,11X,F10.1,10X,F15.1,10X,F15.1)
      IF(SHWO(KAK) .GT. 0.0) GO TO 247
      IF(OELAY(KAK) .EQ. 0.0) GO TO 247
      WRITE (6,246) OELAY(KAK)
  246 FORMAT (1H0,//,17X,80HAGE CLASS ZERO REPRESENTS CLEARCUT ACRES NOT
     1 YET REFORESTEO BECAUSE OF OELAY OF ,F4.0,6H YEARS/1H ,46HEXPECTEO
     2 AFTER SCHEOULEO REGENERATION CUTTING.)
  247 OO 248 I=1,15
      BFAGE(KAK,I) = BFAGE(KAK,I) + BFS(I)
  248 CFAGE(KAK,I) = CFAGE(KAK,I) + CMS(I)
C
C COMPUTE TOTAL YIELOS PER ACRE.
C
      NR = RAGE(KAK,KAN)
      MNK = RAGE(KAK,KAN) - CYCL
      OO 251 I=1,MNK
      IF(BOFC(I) .LT. COMBF(KAK)) GO TO 250
      VLBF(KAN) = VLBF(KAN) + BOFC(I)
  250 TEM = CFMC(I) * 0.01
      IF(TEM .LT. COMCU) GO TO 251
      VLCU(KAN) = VLCU(KAN) + TEM
  251 CONTINUE
      VLBF(KAN) = VLBF(KAN) + BOFO(NR)
      VLCU(KAN) = VLCU(KAN) + CFMO(NR) * 0.01
  252 SITE = SITE + 10.0
  253 CONTINUE
C
C REMOVE EXCESS INITIAL CONOITION CAROS.
C
  260 REAO (5,45) AGEO,OENO,OBHO
      IF(AGEO .EQ. 0.0 .OR. AGEO .GT. ROTA) GO TO 261
      GO TO 260
  261 OO 262 I=KSI,KNO
  262 SUMCF(KAK) = SUMCF(KAK) + ALLCF(KAK,I)
C
C COMPUTE STANOARO ACRES FOR SITE CLASSES.
C
      TEM = NSI(KAK)
      MNK = TEM * 0.5 + 0.5
      MNK = MNK + KSI - 1
      OO 271 I=KSI,KNO
      IF(VLBF(MNK) .EQ. 0.0) GO TO 270
      FAC(I) = VLBF(I) / VLBF(MNK)
      STOAC(I) = AREA(KAK,I) * FAC(I)
      SSTAC = SSTAC + STOAC(I)
      IF(FAC(I) .EQ. 0.0) GO TO 270
      EQIV(I) = 1.0 / FAC(I)
  270 IF(VLCU(MNK) .EQ. 0.0) GO TO 271
      FACCF(I) = VLCU(I) / VLCU(MNK)
      STACF(I) = AREA(KAK,I) * FACCF(I)
      SACCF = SACCF + STACF(I)
      IF(FACCF(I) .EQ. 0.0) GO TO 271
      EQVCF(I) = 1.0 / FACCF(I)
  271 CONTINUE
C
C PRINT PAGE TYPE 13 - GROWING STOCK GOALS BY WORKING GROUP ANO SITE.
C
      WRITE (6,299)
  299 FORMAT (1H1,///,61X,12HPAGE TYPE 13)
      WRITE (6,300)
  300 FORMAT (1H0,//,47X,38HGROWING STOCK GOALS FOR WORKING CIRCLE)
      IF(KAK .EQ. 2) GO TO 301
      WRITE (6,131)
      GO TO 302
  301 WRITE (6,133)
  302 WRITE (6,303) (FORET(I),I=1,3)
  303 FORMAT (1H ,54X,3A8,////)
      WRITE (6,304)
  304 FORMAT (1H0,45X,8HROTATION,11X,10HCU. FT. TO,13X,10HCU. FT. TO,10X
     1,15HM BO. FT. ABOVE)
      WRITE (6,305)
  305 FORMAT (1H ,10X,10HSITE CLASS,10X,5HACRES,12X,3HAGE,13X,13HBO. FT.
     1 LIMIT,10X,12HROTATION AGE,10X,13HBO. FT. LIMIT,///)
      OO 307 I=KSI,KNO
      WRITE (6,306) QUAL(I),AREA(KAK,I),RAGE(KAK,I),SUBCF(KAK,I),ALLCF(K
     1AK,I),SUBBF(KAK,I)
  306 FORMAT (1H0,11X,F5.0,12X,F9.1,10X,F4.0,12X,F12.0,10X,F12.0,8X,F14.
     10)
  307 CONTINUE
      WRITE (6,308) SARSP(KAK),GVLCU(KAK),SUMCF(KAK),GVLBF(KAK)
  308 FORMAT (1H0,12X,6HTOTALS,9X,F10.1,25X,F13.0,9X,F13.0,7X,F15.0)
      WRITE (6,309)
  309 FORMAT (1H0,//,13X,101HCUBIC FEET IN HUNOREOS. TOTAL AREA INCLUDES
     1 ANY LOW SITE ACRES INCORRECTLY CLASSEO AS OPERABLE TYPES.)
C
C PRINT PAGE TYPE 14 - STANOARO ACRES ANO EQUIVALENT AREAS.
C
      WRITE (6,310)
  310 FORMAT (1H1,//,60X,12HPAGE TYPE 14)
      WRITE (6,311)
  311 FORMAT (1H0,/,47X,37HCONVERSION OF AREAS TO STANOARO ACRES)
      IF(KAK .EQ. 2) GO TO 312
      WRITE (6,131)
      GO TO 313
  312 WRITE (6,133)
  313 WRITE (6,303) (FORET(I),I=1,3)
      WRITE (6,314)
  314 FORMAT (1H0,9X,4HSITE,13X,11HTOTAL YIELO,13X,5HACRES,34X,7HAREA IN
     1,13X,13HEQUIVALENT OF)
      WRITE (6,315)
  315 FORMAT (1H ,9X,5HINDEX,13X,8HPER ACRE,14X,7HIN SITE,12X,9HREOUCTIO
     1N,12X,8HSTANOARO,12X,13HSTANOARO ACRE)
      WRITE (6,316)
  316 FORMAT (1H ,9X,5HCLASS,13X.9HM BO. FT.,14X,5HCLASS,14X,6HFACTOR.15
     1X,5HACRES,14X,13HIN SITE ACRES,//)
      OO 318 I=KSI,KNO
      WRITE (6,317) QUAL(I),VLBF(I),AREA(KAK,I),FAC(I),STOAC(I),EQIV(I)
  317 FORMAT(1H0,8X,F5.0,12X,F9.1,12X,F10.1,11X,F9.5,11X,F10.1,13X,F9.5)
  318 CONTINUE
      WRITE (6,319) SARSP(KAK),SSTAC
  319 FORMAT (1H0,/,10X,6HTOTALS,29X,F12.1,29X,F12.1,////)
      WRITE (6,314)
      WRITE (6,315)
      WRITE (6,330)
  330 FORMAT (1H ,9X,5HCLASS,14X,7HCU. FT.,15X,5HCLASS,14X,6HFACTOR,15X,
     15HACRES,14X,13HIN SITE ACRES,//)
      OO 331 I=KSI,KNO
      WRITE(6,317)QUAL(I),VLCU(I),AREA(KAK,I),FACCF(I),STACF(I),EQVCF(I)
  331 CONTINUE
      WRITE (6,332) SARSP(KAK),SACCF
  332 FORMAT (1H0,/,10X,6HTOTALS,29X,F12.1,29X,F12.1)
  400 CONTINUE
      RETURN
      ENO
      SUBROUTINE GUIOE
C
C TO COMPUTE OIFFERENCES BETWEEN PRESENT VOLUMES ANO STOCKING GOALS ANO
C TO PREPARE A GUIOE FOR FUTURE MANAGEMENT.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,OATE(3),OLEV(3),FINL(3),FORET(3),GRBO(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),PCOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWO(3),S
     7LANO,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),OELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBO(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PROO(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BOMAI(3),CUMAI(3),PAIBO(3),PAICU(3),OBHO
     3,DENO,REST,DBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      OIMENSION OFBF(3,15),OFMC(3,15),SATH(3),SBFR(3),SBH(3),SBM(3,5),SB
     1SV(3),SCA(3,5),SCB(3,5),SCU(3,5),SCUR(3),SOBF(3),SOMC(3),SFR(3),SO
     2P(3,5),SSL(3,5),STBS(10),STFO(10),STHR(10),STLV(10),STNC(10),STON(
     310),SANCUT(3),SFNL(3),SOPTA(3),SOPTB(3),SOPTC(3),RGAC(3),FNAC(3),T
     4HAC(3),RGCU(3),FINC(3),THCU(3),RGBO(3),FINB(3),THBO(3),TOTAC(3),TO
     5TCU(3),TOTBO(3),SCNB(3,5),SCRB(3,5),SCNT(10),SCRT(10),SCN(3),SCR(3
     6),SHL(3,5),STHP(10),SAHP(3)
C
C INITIALIZE VARIABLES COMPUTEO BY THIS ROUTINE.
C
      OO 1 I=1,3
      FNAC(I) = 0.0
      RGAC(I) = 0.0
      SAHP(I) = 0.0
      SANCUT(I) = 0.0
      SATH(I) = 0.0
      SBFR(I) = 0.0
      SBH(I) = 0.0
      SBSV(I) = 0.0
      SCN(I) = 0.0
      SCR(I) = 0.0
      SCUR(I) = 0.0
      SOBF(I) = 0.0
      SOMC(I) = 0.0
      SFNL(I) = 0.0
      SFR(I) = 0.0
      SOPTA(I) = 0.0
      SOPTB(I) = 0.0
      SOPTC(I) = 0.0
      OO 1 J=1,5
      SBM(I,J) = 0.0
      SCA(I,J) = 0.0
      SCB(I,J) = 0.0
      SCNB(I,J) = 0.0
      SCRB(I,J) = 0.0
      SCU(I,J) = 0.0
      SHL(I,J) = 0.0
      SOP(I,J) = 0.0
      SSL(I,J) = 0.0
    1 CONTINUE
      OO 2 I=1,3
      OO 2 J=1,15
      OFBF(I,J) = 0.0
    2 OFMC(I,J) = 0.0
      OO 3 I=1,10
      SCNT(I) = 0.0
      SCRT(I) = 0.0
      STBS(I) = 0.0
      STFO(I) = 0.0
      STHP(I) = 0.0
      STHR(I) = 0.0
      STLV(I) = 0.0
      STNC(I) = 0.0
    3 STON(I) = 0.0
      ANNAC = 0.0
      ANNBO = 0.0
      ANNCU = 0.0
      SIOLA = 0.0
      SIOLB = 0.0
      SIOLC = 0.0
      STHBF = 0.0
      STHCM = 0.0
      OURS = SLANO - STYP(17)
C
C COMPUTE OIFFERENCES BETWEEN ACTUAL ANO OESIRED GROWING STOCKS.
C
      OO 10 I=1,NWGP
      OO 10 J=1,15
      OFBF(I,J) = ABFAG(I,J) - BFAGE(I,J)
   10 OFMC(I,J) = AMCAG(I,J) - CFAGE(I,J)
C
C COMPUTE TOTAL OIFFERENCES BETWEEN ACTUAL ANO OESIREO STOCKS.
C
      OO 11 I=1,NWGP
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      DO 11 J=1,15
      SCBF(I) = SOBF(I) + DFBF(I,J)
   11 SCMC(I) = SOMC(I) + DFMC(I,J)
C
C PRINT PAGE TYPE 2 - ACTUAL AND DESIRED GROWING STOCKS AND DIFFERENCES.
C
      DO 40 KA=1,NWGP
      WRITE (6,15)
   15 FORMAT (1H1,/,60X,11HPAGE TYPE 2)
      WRITE (6,16)
   16 FORMAT (1H0,34X,58HCOMPARISON OF ACTUAL GROWING STOCK WITH GROWING
     1 STOCK GOAL)
      WRITE (6,17) (FORET(I),I=1,3)
   17 FORMAT (1H ,54X,3A8)
      IF(KA .EQ. 2) GO TO 19
      WRITE (6,18)
   18 FORMAT (1H0,56X,18HPINE WORKING GROUP,/)
      GO TO 25
   19 WRITE (6,20)
   20 FORMAT (1H0,55X,20HSPRUCE WORKING GROUP,/)
   25 WRITE (6,26)
   26 FORMAT (1H ,34X,62HTHOUSANDS OF BOARD FEET IN TREES 10.0 INCHES D.
     1B.H. AND LARGER,/)
      WRITE (6,27)
   27 FORMAT (1H0,12X,3HAGE,11X,14HACTUAL GROWING,10X,13HGROWING STOCK,1
     15X,6HVOLUME,15X,9HSTATUS OF)
      WRITE (6,28)
   28 FORMAT (1H ,11X,5HCLASS,14X,5HSTOCK,19X,4HGOAL,18X,10HDIFFERENCE,1
     11X,13HACTUAL VOLUME,/)
      DO 34 I=1,15
      J = I * 10
      IF(DFBF(KA,I) .LT. 0.0) GO TO 30
      IF(DFBF(KA,I) .EQ. 0.0) GO TO 32
      WRITE (6,29) J,ABFAG(KA,I),BFAGE(KA,I),DFBF(KA,I)
   29 FORMAT (1H ,12X,I3,11X,F14.1,9X,F14.1,9X,F14.1,14X,7HSURPLUS)
      GO TO 34
   30 WRITE (6,31) J,ABFAG(KA,I),BFAGE(KA,I),DFBF(KA,I)
   31 FORMAT (1H ,12X,I3,11X,F14.1,9X,F14.1,9X,F14.1,14X,7HDEFICIT)
      GO TO 34
   32 WRITE (6,33) J,ABFAG(KA,I),BFAGE(KA,I),DFBF(KA,I)
   33 FORMAT (1H ,12X,I3,11X,F14.1,9X,F14.1,9X,F14.1,14X,7HCORRECT)
   34 CONTINUE
      WRITE (6,35) SBF(KA),GVLBF(KA),SOBF(KA)
   35 FORMAT (1H0,11X,5HTOTAL,10X,F14.1,9X,F14.1,9X,F14.1,/)
      WRITE (6,36)
   36 FORMAT (1H0,31X,67HHUNDREDS OF MERCH. CUBIC FEET IN TREES 6.0 INCH
     1ES D.B.H. AND LARGER,/)
      WRITE (6,27)
      WRITE (6,28)
      DO 39 I=1,15
      J = I * 10
      IF(DFMC(KA,I) .LT. 0.0) GO TO 37
      IF(DFMC(KA,I) .EQ. 0.0) GO TO 38
      WRITE (6,29) J,AMCAG(KA,I),CFAGE(KA,I),DFMC(KA,I)
      GO TO 39
   37 WRITE (6,31) J,AMCAG(KA,I),CFAGE(KA,I),DFMC(KA,I)
      GO TO 39
   38 WRITE (6,33) J,AMCAG(KA,I),CFAGE(KA,I),DFMC(KA,I)
   39 CONTINUE
      WRITE (6,35) SMC(KA),SUMCF(KA),SOMC(KA)
   40 CONTINUE
C
C SUMMARIZE VOLUMES EXPECTED DURING NEXT PERIOD BY BLOCK AND TYPE.
C
      DO 70 I=1,NBK
      DO 70 J=1,5
      SBM(1,I) = SBM(1,I) + BFTH(I,J)
      SCA(1,I) = SCA(1,I) + CUTA(I,J)
      SCB(1,I) = SCB(1,I) + CUTB(I,J)
      SCNB(1,I) = SCNB(1,I) + POCFN(I,J)
      SCRB(1,I) = SCRB(1,I) + POCFR(I,J)
      SCU(1,I) = SCU(1,I) + CMTH(I,J)
      SHL(1,I) = SHL(1,I) + HELP(I,J)
      SOP(1,I) = SOP(1,I) + OPEN(I,J)
      SSL(1,I) = SSL(1,I) + SLVG(I,J)
   70 CONTINUE
      DO 71 I=1,NBK
      DO 71 J=6,10
      SBM(2,I) = SBM(2,I) + BFTH(I,J)
      SCA(2,I) = SCA(2,I) + CUTA(I,J)
      SCB(2,I) = SCB(2,I) + CUTB(I,J)
      SCNB(2,I) = SCNB(2,I) + POCFN(I,J)
      SCRB(2,I) = SCRB(2,I) + POCFR(I,J)
      SCU(2,I) = SCU(2,I) + CMTH(I,J)
      SHL(2,I) = SHL(2,I) + HELP(I,J)
      SOP(2,I) = SOP(2,I) + OPEN(I,J)
      SSL(2,I) = SSL(2,I) + SLVG(I,J)
   71 CONTINUE
      DO 82 I=1,NBK
      DO 82 J=1,10
      SCNT(J) = SCNT(J) + POCFN(I,J)
      SCRT(J) = SCRT(J) + POCFR(I,J)
      STBS(J) = STBS(J) + BFTH(I,J)
      STFO(J) = STFO(J) + CUTB(I,J)
      STHP(J) = STHP(J) + HELP(I,J)
      STHR(J) = STHR(J) + CUTA(I,J)
      STLV(J) = STLV(J) + SLVG(I,J)
      STNC(J) = STNC(J) + CMTH(I,J)
      STON(J) = STON(J) + OPEN(I,J)
   82 CONTINUE
      DO 83 I=1,NWGP
      DO 83 J=1,NBK
      SAHP(I) = SAHP(I) + SHL(I,J)
      SATH(I) = SATH(I) + SOP(I,J)
      SBFR(I) = SBFR(I) + SBM(I,J)
      SBH(I) = SBH(I) + SCA(I,J)
      SBSV(I) = SBSV(I) + SSL(I,J)
      SCN(I) = SCN(I) + SCNB(I,J)
      SCR(I) = SCR(I) + SCRB(I,J)
      SCUR(I) = SCUR(I) + SCU(I,J)
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      SFR(I) = SFR(I) + SCB(I,J)
   83 CONTINUE
C
C PRINT PAGE TYPE 3 - POTENTIAL WORK AND YIELDS FOR NEXT PERIOD.
C
      DO 210 KA=1,NWGP
      WRITE (6,130)
  130 FORMAT (1H1,//,60X,11HPAGE TYPE 3)
      WRITE (6,131)
  131 FORMAT (1H0,40X,46HPOTENTIAL WORK LOAD AND YIELDS FOR NEXT PERIOD)
      WRITE (6,132) (FORET(I),I=1,3)
  132 FORMAT (1H ,52X,3A8)
      WRITE (6,133)
  133 FORMAT (1H0,/,41X,47HACRES OF COMMERCIAL THINNING DURING NEXT PERI
     1OD)
      IF(KA .EQ. 2) GO TO 142
      WRITE (6,141)
  141 FORMAT (1H0,/,4X,5HBLOCK,12X,6HTYPE 1,13X,6HTYPE 2,13X,6HTYPE 3,13
     1X,6HTYPE 4,13X,6HTYPE 5,14X,5HTOTAL,/)
      MK = 1
      NK = 5
      GO TO 150
  142 WRITE (6,143)
  143 FORMAT (1H0,/,4X,5HBLOCK,12X,6HTYPE 6,13X,6HTYPE 7,13X,6HTYPE 8,13
     1X,6HTYPE 9,12X,7HTYPE 10,14X,5HTOTAL,/)
      MK = 6
      NK = 10
  150 DO 154 I=1,NBK
      WRITE (6,153) I,(OPEN(I,J),J=MK,NK),SOP(KA,I)
  153 FORMAT (1H ,4X,I2,10X,F11.1,5(8X,F11.1))
  154 CONTINUE
      WRITE (6,155) (STON(I),I=MK,NK),SATH(KA)
  155 FORMAT (1H0,3X,5HTOTAL,6(8X,F11.1))
      WRITE (6,156)
  156 FORMAT (1H0,//,44X,39HHUNDREDS OF CU. FT. REMOVED BY THINNING)
      IF(KA .EQ. 2) GO TO 157
      WRITE (6,141)
      GO TO 158
  157 WRITE (6,143)
  158 DO 159 I=1,NBK
      WRITE (6,153) I,(CMTH(I,J),J=MK,NK),SCU(KA,I)
  159 CONTINUE
      WRITE (6,155) (STNC(I),I=MK,NK),SCUR(KA)
      WRITE (6,164)
  164 FORMAT (1H0,//,50X,29HM BD. FT. REMOVED BY THINNING)
      IF(KA .EQ. 2) GO TO 165
      WRITE (6,141)
      GO TO 166
  165 WRITE (6,143)
  166 DO 167 I=1,NBK
      WRITE (6,153) I,(BFTH(I,J),J=MK,NK),SBM(KA,I)
  167 CONTINUE
      WRITE (6,155) (STBS(I),I=MK,NK),SBFR(KA)
      WRITE (6,130)
      WRITE (6,172)
  172 FORMAT (1H0,//,44X,39HM BD. FT. TO BE SALVAGED IN NEXT PERIOD)
      IF(KA .EQ. 2) GO TO 173
      WRITE (6,141)
      GO TO 174
  173 WRITE (6,143)
  174 DO 175 I=1,NBK
      WRITE (6,153) I,(SLVG(I,J),J=MK,NK),SSL(KA,I)
  175 CONTINUE
      WRITE (6,155) (STLV(I),I=MK,NK),SBSV(KA)
      WRITE (6,179)
  179 FORMAT (1H0,//,41X,46HM BD. FT. TO BE HARVESTED BY REGENERATION CU
     1TS)
      IF(KA .EQ. 2) GO TO 180
      WRITE (6,141)
      GO TO 181
  180 WRITE (6,143)
  181 DO 182 I=1,NBK
      WRITE (6,153) I,(CUTA(I,J),J=MK,NK),SCA(KA,I)
  182 CONTINUE
      WRITE (6,155) (STHR(I),I=MK,NK),SBH(KA)
      WRITE (6,185)
  185 FORMAT (1H0,//,43X,42HHUNDREDS OF CU. FT. FROM REGENERATION CUTS)
      IF(KA .EQ. 2) GO TO 186
      WRITE (6,141)
      GO TO 187
  186 WRITE (6,143)
  187 DO 188 I=1,NBK
      WRITE (6,153) I,(POCFR(I,J),J=MK,NK),SCRB(KA,I)
  188 CONTINUE
      WRITE (6,155) (SCRT(I),I=MK,NK),SCR(KA)
      WRITE (6,130)
      WRITE (6,193)
  193 FORMAT (1H0,//,37X,54HM BD. FT. TO BE HARVESTED BY FINAL REMOVAL O
     1F OVERWOOD)
      IF(KA .EQ. 2) GO TO 194
      WRITE (6,141)
      GO TO 195
  194 WRITE (6,143)
  195 DO 196 I=1,NBK
      WRITE (6,153) I,(CUTB(I,J),J=MK,NK),SCB(KA,I)
  196 CONTINUE
      WRITE (6,155) (STFO(I),I=MK,NK),SFR(KA)
      WRITE (6,201)
  201 FORMAT (1H0,//,46X,35HHUNDREDS OF CU. FT. FROM FINAL CUTS)
      IF(KA .EQ. 2) GO TO 202
      WRITE (6,141)
      GO TO 203
  202 WRITE (6,143)
  203 DO 204 I=1,NBK
      WRITE (6,153) I,(POCFN(I,J),J=MK,NK),SCNB(KA,I)
  204 CONTINUE
      WRITE (6,155) (SCNT(I),I=MK,NK),SCN(KA)
      WRITE (6,205)
  205 FORMAT (1H0,//,39X,50HACRES OF NONCOMMERCIAL THINNING DURING NEXT
     1PERIOD)
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```
      IF(KA .EQ. 2) GD TO 206
      WRITE (6,141)
      GC TD 207
  206 WRITE (6,143)
  207 CC 208 I=1,NBK
      WRITE (6,153) I,(HELP(I,J),J=MK,NK),SHL(KA,I)
  208 CCNTINUE
      WRITE (6,155) (STHP(I),I=MK,NK),SAHP(KA)
  210 CCNTINUE
C
C SUM THE ANNUAL CUTS 8ASEC DN DPTIMUM AREA REGULATIDN 8Y WORKING GRDUP
C ANC WCRKING CIRCLE.
C
      DO 230 I=1,NWGP
      CC 230 J=1,10
  230 SANCUT(I) = SANCUTII) + ANCLT(I,J)
      DD 235 I=1,NWGP
      SFNL(I) = SANCUT(I)
      IF(SHWD(I) .EQ. C.0) SFNL(I) = 0.0
  235 CCNTINUE
      DC 240 I=1,NWGP
      SCPTA(I) = SANCUT(I) + SFNL(I) + ACINT(I)
      SOPT8(I) = OPBD(I) + FNBD(I) + 8FINT(I)
      SDPTC(I) = OPCU(I) + FNCU(I) + CUINT(I)
      SICLA = SICLA + SOPTA(I)
      SIOL8 = SIDL8 + SDPT8(I)
  240 SIDLC = SIDLC + SOPTC(I)
C
C COMPUTE PDSSI8LE ANNUAL CUTS OURING NEXT PERICD - BASIS WGRK INDEX.
C
      DG 250 I=1,NWGP
      DD 250 J=1,NBK
      OG 250 K=1,15
      RGAC(I) = RGAC(I) + ACRGN(I,J,K)
  250 FNAC(I) = FNAC(I) + ACFNL(I,J,K)
      TEM = 1.0 / TIME
      OG 260 I=1,NWGP
      FIN8(I) = SFR(I) * TEM
      FINC(I) = SCN(I) * TEM
      FNAC(I) = FNAC(I) * TEM
      RGAC(I) = RGAC(I) * TEM
      RG8O(I) = SBH(I) * TEM
      RGCU(I) = SCR(I) * TEM
      THAC(I) = (SATH(I) + SAHP(I)) * TEM
      TH8O(I) = SBFR(I) * TEM
      THCU(I) = SCUR(I) * TEM
  260 CCNTINUE
      DO 261 I=1,NWGP
      TOTAC(I) = RGAC(I) + FNACII) + THAC(I)
      TCTCU(I) = RGCU(I) + FINC(I) + THCU(I)
      TOT8D(I) = RG8D(I) + FIN8(I) + TH8D(I)
      ANNAC = ANNAC + TDTAC(I)
      ANNCU = ANNCU + TOTCU(I)
  261 ANN8D = ANN8D + TOT8D(I)
C
C PRINT PAGE TYPE 1 - SUMMARY DF RESULTS AND GUIDE TO MANAGEMENT.
C
      WRITE (6,299)
  299 FORMAT (1H1,//,59X,11HPAGE TYPE 1)
      WRITE (6,300) (FORET(I),I=1,3)
  300 FORMAT (1HO,//,39X,28HGUIDE FDR MANAGEMENT CF THE ,3A8,/)
      WRITE (6,302) (OATE(I),I=1,3)
  302 FCRMAT (1HO,5X,25HBASED DN CATA CURRENT TG ,3A8)
      WRITE (6,304) SLAND,DURS,STYP(17),TMBR,SBARE,STYP(16),STYP(13)
  304 FGRMAT (1HO,31HTHE WORKING CIRCLE CONSISTS OF ,F10.1,18H ACRES. OF
     1 THESE, ,F10.1,27H ACRES ARE DWNEO BY US AND ,F10.1,19H ACRES ARE
     2INTERIOR/1H ,45HTRACTS DF OTHER DWNERSHIP. OUR AREA INCLUOES ,F10.
     31,17H TIMBERED ACRES, ,F10.1,18H PLANTABLE ACRES, ,F10.1,17H ACRES
     4 MANAGED AS/1H ,11HRANGE, ANO ,F10.1,106H ACRES OF HIGH RECREATION
     5 USE WHERE TIMBER YIELDS ARE INCIDENTAL AND NOT REGULATEC. SEE PAG
     6E TYPE 5, 6, 8,/1H ,30HAND 9 FDR AREA CLASSIFICATIDN.)
      WRITE (6,306)
  306 FCRMAT (1HO,7CHTHE TIMBER RESOURCE OF THIS WORKING CIRCLE WILL BE
     1MANAGED AS FOLLOWS-)
      WRITE (6,308) FINL(1)
  308 FORMAT (1H ,11X,44HPINE WORKING GRDUP- TWG-CUT SHELTERWCOD WITH,F5
     1.1,38H YEARS BETWEEN REMDVAL ANO FINAL CUTS.)
      WRITE (6,310)
  310 FCRMAT (1H ,11X,73HSPRUGE WORKING GRDUP- CLEARCUT BY SMALL AREAS W
     1ITH SEEDING FROM THE SIOE.)
      WRITE (6,320)
  320 FORMAT (1HO,58HREGULATION OF THE CUT WILL BE BY AREA WITH A VCLUME
     1 CHECK.)
      WRITE (6,322)
  322 FGRMAT (1HO,125HWITH THE OECISIONS AND AREAS CN PAGES TYPE 4 AND 1
     13 AND WITH BALANCED OISTRIBUTION OF AGE CLASSES, ALLOWABLE ANNUAL
     2CUT WDULO/1H ,14HBE AS FOLLOWS-)
      WRITE (6,324)
  324 FORMAT (1HO,64X,11HHUNDREDS OF/1H ,42X,5HACRES,19X,7HCU. FT.,17X,9
     1HM BO. FT.)
      WRITE (6,326)
  326 FORMAT (1HO,11X,17HREGENERATION CUTS)
      WRITE (6,328) SANCUT(1),OPCU(1),OPBO(1)
  328 FCRMAT (1HO,15X,18HPINE WDRKING GRCUP,5X,F11.1,14X,F11.1,14X,F11.1
     1)
      WRITE (6,330) SANCUT(2),OPCU(2),OPBD(2)
  330 FORMAT (1HO,15X,20HSPRUCE WORKING GRGUP,3X,F11.1,14X,F11.1,14X,F11
     1.1)
      WRITE (6,340)
  340 FORMAT (1HO,11X,18HFINAL REMGVAL CUTS)
      WRITE (6,328) SFNL(1),FNCU(1),FNBO(1)
      WRITE (6,330) SFNL(2),FNCU(2),FNBD(2)
      WRITE (6,342)
  342 FGRMAT (1HO,11X,17HINTERMEOIATE CUTS)
      WRITE (6,328) ACINT(1),CUINT(1),BFINT(1)
      WRITE (6,330) ACINT(2),CUINT(2),8FINT(2)
      WRITE (6,344)
  344 FCRMAT (1HC,11X,18HTGTAL FOR GNE YEAR)
      WRITE (6,328) SOPTA(1),SDPTC(1),SCPTB(1)
      WRITE (6,330) SOPTA(2),SDPTC(2),SOPTB(2)
      WRITE (6,346) SICLA,SIDLC,SIDL8
  346 FCRMAT (1HO,11X,16HTOTAL ALL GROUPS,11X,F11.1,14X,F11.1,14X,F11.1)
      WRITE (6,348)
  348 FCRMAT (1HO,/,1X,126HCNLY COMMERCIAL VGLUMES INCLUCED IN THE TABLE
     1 ABOVE ANC IN THE NEXT TABLE. CUTS ARE ASSIGNED TD BOARO-FCOT TOTA
     2LS IF PDSSIBLE./1H ,112HTHEY APPEAR IN CU8IC-FGGT TOTALS GNLY WHEN
     3 CCMMERCIAL SAWLCG CUTS ARE NCT PCSSIBLE. AREAS INCLUOE NCNCOMMERC
     4IAL.)
      WRITE (6,350)
  350 FCRMAT (1H1,//,56X,18HPAGE TYPE 1, CCNT.)
      WRITE (6,352)
  352 FCRMAT (1HO,126HEXAMINATION DF THE WORKING CIRCLE INDICATES THAT A
     1CTUAL ANNUAL CUT DURING THE NEXT PERICD CCULO BE AS SHCWN CN PAGES
     2 TYPE 3 IF/1H ,125HALL POSSIBLE CULTURAL CPERATIONS, AS INDICATED
     3BY WDRK CODES, WERE PERFDRMED. IN SUMMARY, THERE IS A PDTENTIAL AN
     4NUAL CUT CF-)
      WRITE (6,324)
      WRITE (6,326)
      WRITE (6,328) RGAC(1),RGCU(1),RG8O(1)
      WRITE (6,330) RGAC(2),RGCU(2),RG8D(2)
      WRITE (6,340)
      WRITE (6,328) FNAC(1),FINC(1),FIN8(1)
      WRITE (6,330) FNAC(2),FINC(2),FINB(2)
      WRITE (6,342)
      WRITE (6,328) THAC(1),THCU(1),TH8D(1)
      WRITE (6,330) THAC(2),THCU(2),THBD(2)
      WRITE (6,344)
      WRITE (6,328) TDTAC(1),TDTCU(1),TCTBD(1)
      WRITE (6,330) TOTAC(2),TOTCU(2),TGTBO(2)
      WRITE (6,346) ANNAC,ANNCU,ANNBD
      WRITE (6,360)
  360 FCRMAT (1HO,//,1X,85HFDRMULA CDMPUTATICN CF ALLOWABLE ANNUAL CUT.
     1CUBIC-FCOT VDLUMES INCLUOE SAWLOG TREES-)
C
C CCMPUTE ANNUAL CUT 8Y HEYER FDRMULA USING M.A.I. FROM YIELC TABLES.
C
      DO 380 I=1,NWGP
      IF(ACJ(I) .EQ. 0.0) GD TO 379
      ALWBF(I) = 8DMAI(I) + (SDBF(I) / AOJ(I))
      ALOWC(I) = CUMAI(I) + (SDMC(I) / ADJ(I))
      GC TD 380
  379 ALW8F(I) = BDMAI(I) + SD8F(I)
      ALOWC(I) = CUMA((I) + SDMC(I)
  380 CCNTINUE
      WRITE (6,390)
  390 FORMAT (1HC,11X,79HHEYER FDRMULA WITH M.A.I. FROM DPTIMUM YIELO TA
     1BLES ANC COMPUTEC GROWING STDCKS)
      WRITE (6,364)
  364 FORMAT (1HO,42X,10HADJUSTMENT,12X,11HHUNDREDS DF/1H ,44X,6HPERIOD,
     116X,7HCU. FT.,17X,9HM 8O. FT.)
      WRITE (6,328) ADJ(1),ALDWC(1),ALWBF(1)
      WRITE (6,330) AOJ(2),ALDWC(2),ALWBF(2)
      WRITE (6,350)
      WRITE (6,392)
  392 FCRMAT (1HO,11X,65HMEAN ANNUAL INCREMENTS USED TO D8TAIN THE RESUL
     1TS TABULATEO A8DVE)
      WRITE (6,364)
      WRITE (6,328) ADJ(1),CUMAI(1),8DMAI(1)
      WRITE (6,330) ADJ(2),CUMAI(2),8DMAI(2)
      WRITE (6,395)
  395 FORMAT (1HO,120HFORMULA COMPUTATIONS ARE BASED DN VDLUME ANO AREA
     1CCMPUTATIONS SUMMARIZED DN OTHER PAGES. VOLUME GDALS ARE CN PAGES
     2TYPE/1H ,120H4, 10, 11, 12, AND 13. ACTUAL AREAS AND VCLUMES ARE C
     3N PAGES TYPE 6, 7, 8, AND 9. CUBIC VOLUMES INCLUOE ALL TREES LARGE
     4R/1H ,68HAND OLDER THAN MINIMUM LIMITS FOR INCLUSION IN GRGWING ST
     5OCK VOLUMF.)
      WRITE (6,400)
  400 FDRMAT (1HO,124HSTANDS SELECTEO FOR HARVEST ANO REGENERATICN WILL
     1INCLUOE THOSE CLASSED AS WDRK INDEX 4, 5, OR 6. IT IS EXPECTEO THA
     2T NEARLY/1H ,126HEQUAL AREAS WILL BE CUT ANNUALLY IN STANDS CF EAG
     3H SITE CLASS. IF THIS IS NDT OESIRABLE, FACTORS THAT INDIGATE RELA
     4TIVE VDLUME/1H ,59HPRODUCTION (PAGE TYPE 14) MAY BE USED FDR AREA
     5ACJUSTMENTS.)
      WRITE (6,405)
  405 FORMAT (1HO,100HIF WDRK IS ODNE OURING NEXT PERIOD AS SPECIFIED BY
     1 WDRK INCEXES, PERIOOIC ANNUAL INCREMENTS WILL BE-)
      WRITE (6,406)
  406 FORMAT (1HO,44X,11HHUNDREOS OF/1H ,46X,7HCU. FT.,17X,9HM BO. FT.)
      WRITE (6,407) PAICU(1),PAIBD(1)
  407 FCRMAT (1HO,15X,18HPINE WDRKING GRCUP,13X,F8.1,16X,F8.1)
      WRITE (6,408) PAICU(2),PAIBO(2)
  408 FDRMAT (1HO,15X,20HSPRUCE WGRKING GRDUP,11X,F8.1,16X,F8.1)
      WRITE (6,350)
      WRITE (6,415)
  415 FDRMAT (1HO,85HCORRESPONDING PERIOOIC INCREMENTS WITH SAME ASSUMPT
     1IONS CONCERNING WORK ACCOMPLISHED-)
      WRITE (6,416)
  416 FORMAT (1HO,40X,18HPINE WDRKING GROUP,36X,20HSPRUCE WCRKING GROUP)
      WRITE (6,417)
  417 FORMAT (1H ,15X,3HAGE,14X,11HHUNOREOS OF,44X,11HHUNDREDS DF)
      WRITE (6,418)
  418 FCRMAT (1H ,4X,5HBLDCK,5X,5HCLASS,15X,7HCU. FT.,15X,9HM BD. FT.,24
     1X,7HCU. FT.,15X,9HM BO. FT.,/)
      DD 420 I=1,NBK
      DG 420 J=1,15
      MA = ((J-1) * 10) + 1
      NA = J * 10
      WRITE (6,419) I,MA,NA,GRMC(1,I,J),GRBO(1,I,J),GRMG(2,I,J),GRBO(2,I
     1,J)
  419 FORMAT (1H ,5X,I2,6X,I3,1H-,I3,13X,F10.1,12X,F10.1,23X,F10.1,12X,F
     110.1)
  420 CCNTINUE
      RETURN
      ENO
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APPENDIX 2

An Application of TEVAP

An example of what TEVAP can do is provided by the hypothetical situation described below and by reproductions of the computer records produced. The test forest, the mythical Bogus National Forest, is managed as one working circle. The working circle is subdivided into three blocks on the basis of typography, transportation system, and distribution of wood-using plants. Total areas of each block, interior tracts of other ownership, high use recreation areas, and so forth, are known. The forest has not yet been subdivided into compartments; the AREA2 option of TEVAP is applicable.

Numerous decisions have been made concerning management objectives and how they may be attained. Past records of the forest and silvicultural characteristics of each species were considered during the planning process. Decisionmaking was assisted by computer simulation of forest activities (Myers 1968). The effects of changes in rotation length and other variables subject to control were examined. It was decided that the following controls would apply to timber management on the working circle:

Working groups.

a. Pine working group—Pine under two-cut shelterwood.
b. Spruce working group—Spruce clearcut in small patches with natural regeneration.
c. A third group is still in the planning stage—selectively-cut pine in areas of highest scenic value. Algorithms applicable to many-aged stands will be added to GOT and GOAL, when needed.

Rotations.

a. Pine group—110 years for site 40, 130 years for remainder.
b. Spruce group—90 years for site 50, 110 years for remainder.

Thinning.

a. Pine group—Initial thinning at age 30 to level 100. Subsequent thinnings at 20-year intervals to level 100.
b. Spruce group—Initial thinning at age 30 to level 100. Subsequent thinnings at 20-year intervals to level 90.

Minimum site class to be managed for wood products.

a. Pine group—site index 40.
b. Spruce group—site index 50.

Many decisions provided as inputs to the program are recorded on page type 4 of the output reproduced below. Other input data are recorded on pages of types 1, 10, and 13.

An inventory of the timber resource and analysis of the data were completed 5 years ago. At that time, summary cards with the items specified for data card type 16 were punched. The inventory file has increased annually through addition of records that describe thinning jobs and other changes in stands of known area. The inventory file now consists of 251 records, 104 of which are job and similar reports and 147 sample "unknown" parts of the working circle. All inventory records are updated to a common time base annually (Appendix 5).

Land books and other records provide the total number of acres in each block and the area occupied by nonforest vegetative and use types 13 to 17, inclusive. These acreages are recorded on pages type 5 and 6.

The output that follows requires use of data cards of all types except for types 8 to 13, inclusive. Pages appear in the order in which they might appear in a management guide, not in the order produced. For brevity, only two sheets each of pages type 10, 11, and 12 are reproduced. Complete output would include six sheets of each of these types, one for each site index class of each working group. Examples of pages produced with card types 8 to 13 appear in Appendix 3.

A management guide can be produced on microfilm annually for distribution to appropriate land managers and staff. The example below required 69.5 seconds of central processor time for compilation and execution. The time required for computation by conventional methods might be as many days!

PAGE TYPE I

GUIDE FOR MANAGEMENT OF THE BOGUS NATIONAL FOREST

BASED ON DATA CURRENT TO JANUARY 4, 1971

THE WORKING CIRCLE CONSISTS OF 292490.4 ACRES. OF THESE, 244691.0 ACRES ARE OWNED BY US AND 47799.4 ACRES ARE INTERIOR TRACTS OF OTHER OWNERSHIP. OUR AREA INCLUDES 204947.8 TIMBERED ACRES, 25661.5 PLANTABLE ACRES, 8198.8 ACRES MANAGED AS RANGE, AND 3911.1 ACRES OF HIGH RECREATION USE WHERE TIMBER YIELDS ARE INCIDENTAL AND NOT REGULATED. SEE PAGE TYPE 5, 6, 8, AND 9 FOR AREA CLASSIFICATION.

THE TIMBER RESOURCE OF THIS WORKING CIRCLE WILL BE MANAGED AS FOLLOWS-
PINE WORKING GROUP- TWO-CUT SHELTERWOOD WITH 20.0 YEARS BETWEEN REMOVAL AND FINAL CUTS.
SPRUCE WORKING GROUP- CLEARCUT BY SMALL AREAS WITH SEEDING FROM THE SIDE.

REGULATION OF THE CUT WILL BE BY AREA WITH A VOLUME CHECK.

WITH THE DECISIONS AND AREAS ON PAGES TYPE 4 AND 13 AND WITH BALANCED DISTRIBUTION OF AGE CLASSES, ALLOWABLE ANNUAL CUT WOULD BE AS FOLLOWS-

	ACRES	HUNDREDS OF CU. FT.	M BD. FT.
REGENERATION CUTS			
PINE WORKING GROUP	1666.3	0.0	17128.4
SPRUCE WORKING GROUP	167.8	0.0	2027.6
FINAL REMOVAL CUTS			
PINE WORKING GROUP	1666.3	0.0	10664.1
SPRUCE WORKING GROUP	0.0	0.0	0.0
INTERMEDIATE CUTS			
PINE WORKING GROUP	8054.4	7071.9	7032.9
SPRUCE WORKING GROUP	644.3	1248.8	326.3
TOTAL FOR ONE YEAR			
PINE WORKING GROUP	11386.9	7071.9	34825.3
SPRUCE WORKING GROUP	812.1	1248.8	2353.9
TOTAL ALL GROUPS	12199.0	8320.7	37179.2

ONLY COMMERCIAL VOLUMES INCLUDED IN THE TABLE ABOVE AND IN THE NEXT TABLE. CUTS ARE ASSIGNED TO BOARD-FOOT TOTALS IF POSSIBLE. THEY APPEAR IN CUBIC-FOOT TOTALS ONLY WHEN COMMERCIAL SAWLOG CUTS ARE NOT POSSIBLE. AREAS INCLUDE NONCOMMERCIAL.

PAGE TYPE I, CONT.

EXAMINATION OF THE WORKING CIRCLE INDICATES THAT ACTUAL ANNUAL CUT DURING THE NEXT PERIOD COULD BE AS SHOWN ON PAGES TYPE 3 IF ALL POSSIBLE CULTURAL OPERATIONS, AS INDICATED BY WORK CODES, WERE PERFORMED. IN SUMMARY, THERE IS A POTENTIAL ANNUAL CUT OF-

	ACRES	HUNDREDS OF CU. FT.	M BD. FT.
REGENERATION CUTS			
PINE WORKING GROUP	3588.3	9681.4	29755.7
SPRUCE WORKING GROUP	239.0	0.0	3807.6
FINAL REMOVAL CUTS			
PINE WORKING GROUP	2151.9	0.0	6900.4
SPRUCE WORKING GROUP	0.0	0.0	0.0
INTERMEDIATE CUTS			
PINE WORKING GROUP	8624.1	19270.5	3298.7
SPRUCE WORKING GROUP	773.0	5480.1	1733.8
TOTAL FOR ONE YEAR			
PINE WORKING GROUP	14364.4	28951.9	39954.8
SPRUCE WORKING GROUP	1012.0	5480.1	5541.4
TOTAL ALL GROUPS	15376.3	34431.9	45496.2

FORMULA COMPUTATION OF ALLOWABLE ANNUAL CUT. CUBIC-FOOT VOLUMES INCLUDE SAWLOG TREES-

HEYER FORMULA WITH M.A.I. FROM OPTIMUM YIELD TABLES AND COMPUTED GROWING STOCKS

	ADJUSTMENT PERIOD	HUNDREDS OF CU. FT.	M BD. FT.
PINE WORKING GROUP	30.0	74829.7	25314.5
SPRUCE WORKING GROUP	30.0	18929.9	4838.2

PAGE TYPE 1, CONT.

MEAN ANNUAL INCREMENTS USED TO OBTAIN THE RESULTS TABULATED ABOVE

	ADJUSTMENT PERIOD	HUNDREDS OF CU. FT.	M BD. FT.
PINE WORKING GROUP	30.0	84922.0	35617.8
SPRUCE WORKING GROUP	30.0	7490.2	2401.2

FORMULA COMPUTATIONS ARE BASED ON VOLUME AND AREA COMPUTATIONS SUMMARIZED ON OTHER PAGES. VOLUME GOALS ARE ON PAGES TYPE 4, 10, 11, 12, AND 13. ACTUAL AREAS AND VOLUMES ARE ON PAGES TYPE 6, 7, 8, AND 9. CUBIC VOLUMES INCLUDE ALL TREES LARGER AND OLDER THAN MINIMUM LIMITS FOR INCLUSION IN GROWING STOCK VOLUME.

STANDS SELECTED FOR HARVEST AND REGENERATION WILL INCLUDE THOSE CLASSED AS WORK INDEX 4, 5, OR 6. IT IS EXPECTED THAT NEARLY EQUAL AREAS WILL BE CUT ANNUALLY IN STANDS OF EACH SITE CLASS. IF THIS IS NOT DESIRABLE, FACTORS THAT INDICATE RELATIVE VOLUME PRODUCTION (PAGE TYPE 14) MAY BE USED FOR AREA ADJUSTMENTS.

IF WORK IS DONE DURING NEXT PERIOD AS SPECIFIED BY WORK INDEXES, PERIODIC ANNUAL INCREMENTS WILL BE-

	HUNDREDS OF CU. FT.	M BD. FT.
PINE WORKING GROUP	118077.2	47095.1
SPRUCE WORKING GROUP	18426.1	6663.4

PAGE TYPE 1, CONT.

CORRESPONDING PERIODIC INCREMENTS WITH SAME ASSUMPTIONS CONCERNING WORK ACCOMPLISHED-

		PINE WORKING GROUP		SPRUCE WORKING GROUP	
BLOCK	AGE CLASS	HUNDREDS OF CU. FT.	M BD. FT.	HUNDREDS OF CU. FT.	M BD. FT.
1	1- 10	0.0	0.0	0.0	0.0
1	11- 20	0.0	0.0	0.0	0.0
1	21- 30	8.4	0.0	0.0	0.0
1	31- 40	4979.4	0.0	0.0	0.0
1	41- 50	47312.8	435.7	550.9	40.9
1	51- 60	14230.2	0.0	0.0	0.0
1	61- 70	26498.3	1845.9	0.0	0.0
1	71- 80	35148.8	13829.5	0.0	0.0
1	81- 90	19751.9	274.5	0.0	0.0
1	91-100	111.4	69.8	0.0	0.0
1	101-110	61500.1	24610.5	19084.0	10018.7
1	111-120	21151.1	13120.2	101.0	64.7
1	121-130	107637.7	46844.0	51.9	33.4
1	131-140	11788.1	7138.9	4501.6	2675.1
1	141-150	25802.9	15689.5	0.0	0.0
2	1- 10	0.0	0.0	0.0	0.0
2	11- 20	164851.4	132458.2	0.0	0.0
2	21- 30	409.8	336.2	0.0	0.0
2	31- 40	116.2	1.3	0.0	0.0
2	41- 50	32520.1	2531.7	8799.9	0.0
2	51- 60	27999.0	5699.3	35446.5	4874.4
2	61- 70	40249.7	5914.4	182.0	21.7
2	71- 80	36220.3	9742.8	50204.1	3199.1
2	81- 90	30369.5	12720.7	0.0	0.0
2	91-100	58031.8	30563.8	11346.7	7229.1
2	101-110	54957.2	13043.4	23679.5	19167.7
2	111-120	36580.6	12010.4	446.7	306.8
2	121-130	29613.4	15067.4	0.0	0.0
2	131-140	14266.1	8082.1	0.0	0.0
2	141-150	21200.5	9430.4	0.0	0.0
3	1- 10	0.0	0.0	0.0	0.0
3	11- 20	0.0	0.0	0.0	0.0
3	21- 30	43529.0	22954.1	0.0	0.0
3	31- 40	8415.4	0.0	0.0	0.0
3	41- 50	20688.0	798.1	0.0	0.0
3	51- 60	2323.3	16.3	0.0	0.0
3	61- 70	11277.3	908.3	0.0	0.0
3	71- 80	12935.7	1954.3	0.0	0.0
3	81- 90	13257.4	5756.2	0.0	0.0
3	91-100	7350.7	3936.0	0.0	0.0
3	101-110	15109.3	8981.4	15385.5	9102.3
3	111-120	35976.5	15170.2	14480.4	9900.4
3	121-130	60397.3	18400.1	0.0	0.0
3	131-140	9449.1	5984.0	0.0	0.0
3	141-150	16756.8	4631.8	0.0	0.0

PAGE TYPE 2

COMPARISON OF ACTUAL GROWING STOCK WITH GROWING STOCK GOAL
BOGUS NATIONAL FOREST

PINE WORKING GROUP

THOUSANDS OF BOARD FEET IN TREES 10.0 INCHES D.B.H. AND LARGER

AGE CLASS	ACTUAL GROWING STOCK	GROWING STOCK GOAL	VOLUME DIFFERENCE	STATUS OF ACTUAL VOLUME
10	0.0	97643.0	-97643.0	DEFICIT
20	0.0	0.0	0.0	CORRECT
30	0.0	0.0	0.0	CORRECT
40	0.0	0.0	0.0	CORRECT
50	0.0	0.0	0.0	CORRECT
60	0.0	15731.0	-15731.0	DEFICIT
70	219.1	52258.4	-52039.3	DEFICIT
80	10330.1	99933.7	-89603.6	DEFICIT
90	16599.9	149913.2	-133313.3	DEFICIT
100	38095.3	167977.0	-129881.8	DEFICIT
110	76097.3	203417.8	-127320.5	DEFICIT
120	123900.4	199403.6	-75503.1	DEFICIT
130	215117.2	64744.1	150373.1	SURPLUS
140	103359.8	0.0	103359.8	SURPLUS
150	158204.7	0.0	158204.7	SURPLUS
TOTAL	741923.7	1051021.8	-309098.0	

HUNDREDS OF MERCH. CUBIC FEET IN TREES 6.0 INCHES D.B.H. AND LARGER

AGE CLASS	ACTUAL GROWING STOCK	GROWING STOCK GOAL	VOLUME DIFFERENCE	STATUS OF ACTUAL VOLUME
10	0.0	184955.2	-184955.2	DEFICIT
20	0.0	0.0	0.0	CORRECT
30	0.0	2448.0	-2448.0	DEFICIT
40	209.1	63022.2	-62813.1	DEFICIT
50	79628.0	146603.2	-66975.2	DEFICIT
60	49538.8	220570.1	-171031.4	DEFICIT
70	107007.9	306266.5	-199258.6	DEFICIT
80	155484.9	338672.7	-183187.8	DEFICIT
90	161272.0	417484.8	-256212.8	DEFICIT
100	170358.4	414200.1	-243841.7	DEFICIT
110	378741.9	457763.3	-79021.4	DEFICIT
120	343991.6	415929.2	-71937.6	DEFICIT
130	640935.4	126431.5	514503.9	SURPLUS
140	240455.7	0.0	240455.7	SURPLUS
150	463953.5	0.0	463953.5	SURPLUS
TOTAL	2791577.2	3094346.9	-302769.7	

PAGE TYPE 2

COMPARISON OF ACTUAL GROWING STOCK WITH GROWING STOCK GOAL
BOGUS NATIONAL FOREST

SPRUCE WORKING GROUP

THOUSANDS OF BOARD FEET IN TREES 10.0 INCHES D.B.H. AND LARGER

AGE CLASS	ACTUAL GROWING STOCK	GROWING STOCK GOAL	VOLUME DIFFERENCE	STATUS OF ACTUAL VOLUME
10	0.0	0.0	0.0	CORRECT
20	0.0	0.0	0.0	CORRECT
30	0.0	0.0	0.0	CORRECT
40	0.0	0.0	0.0	CORRECT
50	23.3	0.0	23.3	SURPLUS
60	0.0	683.4	-683.4	DEFICIT
70	0.0	4560.7	-4560.7	DEFICIT
80	0.0	10612.2	-10612.2	DEFICIT
90	0.0	15319.3	-15319.3	DEFICIT
100	21167.2	17259.5	3907.7	SURPLUS
110	62660.7	0.0	62660.7	SURPLUS
120	19411.7	0.0	19411.7	SURPLUS
130	177.3	0.0	177.3	SURPLUS
140	18104.6	0.0	18104.6	SURPLUS
150	0.0	0.0	0.0	CORRECT
TOTAL	121544.8	48435.1	73109.7	

HUNDREDS OF MERCH. CUBIC FEET IN TREES 6.0 INCHES D.B.H. AND LARGER

AGE CLASS	ACTUAL GROWING STOCK	GROWING STOCK GOAL	VOLUME DIFFERENCE	STATUS OF ACTUAL VOLUME
10	0.0	0.0	0.0	CORRECT
20	0.0	0.0	0.0	CORRECT
30	0.0	0.0	0.0	CORRECT
40	0.0	3736.5	-3736.5	DEFICIT
50	523.1	13979.6	-13456.4	DEFICIT
60	35647.9	25178.6	10469.4	SURPLUS
70	287.6	36979.8	-36692.3	DEFICIT
80	47317.7	40071.9	7245.8	SURPLUS
90	0.0	43825.7	-43825.7	DEFICIT
100	67018.1	40992.8	26025.2	SURPLUS
110	277328.2	0.0	277328.2	SURPLUS
120	72201.0	0.0	72201.0	SURPLUS
130	461.8	0.0	461.8	SURPLUS
140	47170.2	0.0	47170.2	SURPLUS
150	0.0	0.0	0.0	CORRECT
TOTAL	547955.6	204764.9	343190.7	

PAGE TYPE 3

POTENTIAL WORK LOAC ANO YIELOS FOR NEXT PERICC
8CGUS NATIONAL FOREST

ACRES OF COMMERCIAL THINNING OURING NEXT PERICO

8LCCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	6191.2	9517.9	0.0	15709.2
2	0.0	1685.9	8069.5	3149.6	0.0	12904.9
3	0.0	0.0	2808.7	2808.7	0.0	5617.4
TCTAL	0.0	1685.9	17069.4	15476.2	0.0	34231.5

HUNCREOS CF CU. FT. REMCVEO 8Y THINNING

8LCCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	49443.3	43527.3	0.0	92970.6
2	0.0	13626.8	51634.7	14201.9	0.0	79463.5
3	0.0	0.0	20270.8	0.0	0.0	20270.8
TOTAL	0.0	13626.8	121348.9	57729.2	0.0	192704.9

M 80. FT. REMOVEO 8Y THINNING

8LCCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	0.0	14596.6	0.0	14596.6
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	3217.7	15173.1	0.0	18390.7
TOTAL	0.0	0.0	3217.7	29769.7	0.0	32987.4

PAGE TYPE 3

M 80. FT. TO 8E SALVAGEC IN NEXT PERIOO

8LCCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
TCTAL	0.0	0.0	0.0	0.0	0.0	0.0

M 80. FT. TO 8E HARVESTEO 8Y REGENERATION CUTS

8LCCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	0.0	86592.7	52597.5	139190.2
2	0.0	0.0	242.7	56487.4	27793.8	84523.9
3	0.0	0.0	0.0	68353.2	5489.9	73843.1
TCTAL	0.0	0.0	242.7	211433.3	85881.2	297557.2

HUNCREOS OF CU. FT. FROM REGENERATION CUTS

8LCCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	0.0	0.0	41976.1	41976.1
2	0.0	0.0	0.0	24504.3	30333.2	54837.5
3	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	24504.3	72309.3	96813.6

PAGE TYPE 3

M BD. FT. TO BE HARVESTED BY FINAL REMOVAL OF OVERWOOD

BLOCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	0.0	6358.7	1079.5	7438.2
2	0.0	0.0	0.0	2098.1	11837.9	13936.0
3	0.0	0.0	0.0	24127.1	23502.3	47629.4
TOTAL	0.0	0.0	0.0	32583.9	36419.7	69003.6

HUNDREDS OF CU. FT. FROM FINAL CUTS

BLOCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

ACRES OF NONCOMMERCIAL THINNING DURING NEXT PERIOD

BLOCK	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
1	8.9	12493.6	3117.9	3180.1	106.7	18907.1
2	515.6	4764.3	6512.4	191.2	0.0	11983.5
3	4266.4	5617.4	8426.1	2808.7	0.0	21118.7
TOTAL	4790.9	22875.3	18056.4	6180.0	106.7	52009.3

PAGE TYPE 3

POTENTIAL WORK LOAD AND YIELDS FOR NEXT PERIOD
BOGUS NATIONAL FOREST

ACRES OF COMMERCIAL THINNING DURING NEXT PERIOD

BLOCK	TYPE 6	TYPE 7	TYPE 8	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	4724.3	0.0	0.0	4724.3
3	0.0	0.0	0.0	1404.4	0.0	1404.4
TOTAL	0.0	0.0	4724.3	1404.4	0.0	6128.7

HUNDREDS OF CU. FT. REMOVED BY THINNING

BLOCK	TYPE 6	TYPE 7	TYPE 8	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	49134.4	0.0	0.0	49134.4
3	0.0	0.0	0.0	5666.4	0.0	5666.4
TOTAL	0.0	0.0	49134.4	5666.4	0.0	54800.8

M BD. FT. REMOVED BY THINNING

BLOCK	TYPE 6	TYPE 7	TYPE 8	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	9378.7	0.0	0.0	9378.7
3	0.0	0.0	0.0	7959.5	0.0	7959.5
TOTAL	0.0	0.0	9378.7	7959.5	0.0	17338.1

PAGE TYPF 3

M BO. FT. TO BE SALVAGEC IN NEXT PERIOO

BLCCK	TYPE 6	TYPE 7	TYPE B	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.C	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

M BO. FT. TO BE HARVESTEO BY REGENERATICN CUTS

BLCCK	TYPE 6	TYPE 7	TYPE B	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	20779.7	0.0	20779.7
2	0.0	0.0	0.0	17296.3	0.0	17296.3
3	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	3B076.0	0.0	3B076.0

HUNOREOS OF CU. FT. FROM REGENERATION CUTS

BLCCK	TYPE 6	TYPE 7	TYPE B	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.C	0.0	0.0	0.0	0.0
TCTAL	0.0	0.C	0.0	0.0	0.0	0.0

PAGE TYPE 3

M BO. FT. TO BE HARVESTEO BY FINAL REMOVAL OF OVERWOOO

BLCCK	TYPE 6	TYPE 7	TYPE B	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

HUNOREOS OF CU. FT. FROM FINAL CUTS

BLCCK	TYPE 6	TYPE 7	TYPE B	TYPE 9	TYPE 10	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.C	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

ACRES OF NONCOMMERCIAL THINNING DURING NEXT PERIOO

BLCCK	TYPE 6	TYPE 7	TYPE B	TYPE 9	TYPE 10	TOTAL
1	0.0	26.7	0.0	0.0	0.0	26.7
2	0.0	1574.B	0.0	0.0	0.0	1574.B
3	0.0	0.0	0.0	0.0	0.0	0.0
TCTAL	0.0	1601.5	0.0	0.0	0.0	1601.5

PAGE TYPE 4

RECORD OF MANAGEMENT DECISIONS AND CURRENT CONDITIONS
BOGUS NATIONAL FOREST

NUMBER OF BLOCKS - 3

NUMBER OF COMPARTMENTS - 289

MINIMUM AGE FOR GROWING STOCK - 30

LENGTH OF CUTTING CYCLE, YEARS - 20.

MINIMUM M BD. FT. FOR GROWING STOCK - 1.5

LENGTH OF PREDICTION PERIOD, YEARS - 10.

LENGTH OF PLANNING PERIOD, YEARS - 10.

	PINE GROUP	SPRUCE GROUP
LOWEST SITE CLASS TO BE MANAGED	40.0	50.0
LENGTH OF ADJUSTMENT PERIOD, YEARS	30.0	30.0
M BD. FT. TO BE LEFT AS SEED SOURCE	4.0	0.0
CU. FT. TO BE LEFT AS SEED SOURCE	8.0	0.0
YEARS TO LEAVE OVERWOOD AS SEED SOURCE	20.0	0.0
EXPECTED DELAY IN REGENERATION, YEARS	10.0	10.0
BD. FT. GROWTH OF SHELTERWOOD, PERCENT	3.00	2.50
CU. FT. GROWTH OF SHELTERWOOD, PERCENT	2.50	2.00
STOCKING LEVEL FOR INITIAL THINNING	100.0	100.0
STOCKING LEVEL, SUBSEQUENT THINNINGS	100.0	90.0
MINIMUM COMMERCIAL CUT, M BD. FT.	1.5	1.5
MINIMUM COMMERCIAL CUT, CU. FT.	4.0	4.0

CUBIC FEET IN HUNDREDS

PAGE TYPE 5

AREAS OF TYPES IN WORKING CIRCLE
BOGUS NATIONAL FOREST

COVER TYPE		ACRES	*	COVER TYPE		ACRES
1	PIN 0-30	22057.9	*	11	DEFOREST-B	8152.2
2	PIN 31-50	26471.2	*	12	DEFOREST-G	17509.3
3	PIN 51-100	52957.2	*	13	RECREATION	3911.1
4	PIN 101-40	68467.0	*	14	BARREN	581.6
5	PIN 141+	18622.4	*	15	BRUSHLAND	1390.2
6	SPR 0-30	1558.9	*	16	RANGE-HERB	8198.8
7	SPR 31-50	1610.4	*	17	PRIVATE	47799.4
8	SPR 51-100	4764.3	*	18		0.0
9	SPR 101-40	8438.6	*	19		0.0
10	SPR 141+	0.0	*	20		0.0
					TOTAL AREA	292490.4

PINE GROUP - 188575.7 SPRUCE GROUP - 16372.2 DEFORESTED ACRES - 25661.5

PAGE TYPE 6

TOTAL AREAS OF BLOCKS AND WORKING CIRCLE
DOGUS NATIONAL FOREST

BLOCK NO.	TOTAL ACRES	****** PLANTADLE ACRES FOREST SOIL ********* BRUSHY	GRASSY	TOTAL	FOREST AND REGENERATING PINE	SPRUCE
1	103754.5	5223.4	1981.2	7204.5	68500.4	4739.0
2	104194.5	84.5	5226.5	5311.0	69162.8	8811.2
3	84541.4	2844.3	10301.6	13145.9	50912.5	2822.0
TOTAL	292490.4	8152.2	17509.3	25661.5	188575.7	16372.2

DESIGNATIONS OF TYPES

1	PIN 0-30	*	11	DEFOREST-B
2	PIN 31-50	*	12	DEFOREST-G
3	PIN 51-100	*	13	RECREATION
4	PIN 101-40	*	14	BARREN
5	PIN 141+	*	15	BRUSHLAND
6	SPR 0-30	*	16	RANGE-HERB
7	SPR 31-50	*	17	PRIVATE
8	SPR 51-100	*	18	
9	SPR 101-40	*	19	
10	SPR 141+	*	20	

PAGE TYPE 7

VOLUMES OF BLOCKS AND WORKING CIRCLE
BOGUS NATIONAL FOREST

BLOCK NO.	TOTAL PINE WORKING GROUP TOTAL CU. FT.	MERCH. CU. FT.	M BD. FT.	TOTAL SPRUCE WORKING GROUP TOTAL CU. FT.	MERCH. CU. FT.	M BD. FT.	TOTAL VOLUME OF BLOCK TOTAL CU. FT.	MERCH. CU. FT.	M BD. FT.
1	1476578.4	1124920.5	310747.4	145796.1	132422.6	26683.6	1622374.5	1257343.1	337431.1
2	1334102.0	1019114.2	224349.6	362130.0	292676.9	66383.8	1696232.1	1311791.2	290733.4
3	840874.4	647542.5	206826.7	131300.2	122856.1	28477.4	972174.6	770398.6	235304.0
SUMS	3651554.8	2791577.2	741923.7	639226.4	547955.6	121544.8	4290781.1	3339532.8	863468.5

CUBIC FEET IN HUNDREDS, BOARD FEET IN THOUSANDS

PAGE TYPE 8

TOTAL AREAS AND VOLUMES OF BLOCKS AND WORKING CIRCLE
BOGUS NATIONAL FOREST

BLOCK NO.	TYPE NO.	TOTAL ACRES	TOTAL CU. FT.	MERCH. CU. FT.	M BD. FT.	ACRES LOW SITE	NUMBER OF RECORDS
1	1	3117.9	0.0	0.0	0.0	0.0	5.
1	2	14350.3	130964.8	17865.4	0.0	0.0	15.
1	3	12706.9	264375.0	152749.9	3348.2	0.0	16.
1	4	30415.1	849610.6	741686.6	232377.5	0.0	31.
1	5	7910.2	231628.1	212618.6	75021.8	0.0	8.
1	6	1545.6	0.0	0.0	0.0	0.0	1.
1	7	35.6	937.8	523.1	23.3	0.0	2.
1	8	0.0	0.0	0.0	0.0	0.0	0.
1	9	3157.8	144858.3	131899.5	26660.4	0.0	5.
1	10	0.0	0.0	0.0	0.0	0.0	0.
1	11	5223.4	0.0	0.0	0.0	0.0	7.
1	12	1981.2	0.0	0.0	0.0	0.0	5.
2	1	8753.9	0.0	0.0	0.0	0.0	13.
2	2	6503.5	111185.6	43240.6	0.0	0.0	8.
2	3	27611.1	527984.0	382229.1	51120.6	0.0	29.
2	4	19795.2	497658.9	419830.4	120866.6	0.0	21.
2	5	6499.1	197273.5	173814.1	52362.4	0.0	6.
2	6	0.0	0.0	0.0	0.0	0.0	0.
2	7	1574.8	19122.2	0.0	0.0	0.0	1.
2	8	4764.3	192187.4	150271.3	21167.2	0.0	4.
2	9	2472.1	150820.5	142405.7	45216.5	0.0	3.
2	10	0.0	0.0	0.0	0.0	0.0	0.
2	11	84.5	0.0	0.0	0.0	0.0	2.
2	12	5226.5	0.0	0.0	0.0	0.0	8.
3	1	10186.1	0.0	0.0	0.0	0.0	12.
3	2	5617.4	93814.5	18731.1	0.0	0.0	4.
3	3	12639.2	151022.0	108683.0	10775.6	0.0	9.
3	4	18256.6	493855.5	442607.6	165230.7	1404.4	13.
3	5	4213.1	102182.4	77520.8	30820.4	0.0	3.
3	6	13.3	0.0	0.0	0.0	0.0	1.
3	7	0.0	0.0	0.0	0.0	0.0	0.
3	8	0.0	0.0	0.0	0.0	0.0	0.
3	9	2808.7	131300.2	122856.1	28477.4	0.0	2.
3	10	0.0	0.0	0.0	0.0	0.0	0.
3	11	2844.3	0.0	0.0	0.0	0.0	4.
3	12	10301.6	0.0	0.0	0.0	0.0	13.
TOTALS		230609.3	4290781.1	3339532.8	863468.5	1404.4	251.

CUBIC FEET IN HUNDREDS, BOARD FEET IN THOUSANDS

PAGE TYPE 9

DISTRIBUTION OF AREA BY SITE INDEX CLASS
BOGUS NATIONAL FOREST

BLOCK	SITE INDEX	ACRES OF PINE WORKING GROUP	ACRES OF SPRUCE WORKING GROUP	DEFORESTED ACRES
1	10	0.0	0.0	0.0
1	20	0.0	0.0	0.0
1	30	0.0	0.0	0.0
1	40	4921.3	0.0	3237.8
1	50	20563.8	40.0	2207.8
1	60	30170.6	1590.0	1759.0
1	70	12844.7	3109.0	0.0
1	80	0.0	0.0	0.0
1	90	0.0	0.0	0.0
1	100	0.0	0.0	0.0
2	10	0.0	0.0	0.0
2	20	0.0	0.0	0.0
2	30	0.0	0.0	0.0
2	40	9653.1	0.0	0.0
2	50	25876.4	1574.8	3291.8
2	60	25279.5	3242.9	222.2
2	70	8353.8	3993.6	1797.1
2	80	0.0	0.0	0.0
2	90	0.0	0.0	0.0
2	100	0.0	0.0	0.0
3	10	0.0	0.0	0.0
3	20	0.0	0.0	0.0
3	30	1404.4	0.0	0.0
3	40	12857.0	0.0	0.0
3	50	11234.9	0.0	5706.3
3	60	15505.7	0.0	4453.1
3	70	9910.5	2822.0	2986.5
3	80	0.0	0.0	0.0
3	90	0.0	0.0	0.0
3	100	0.0	0.0	0.0
TOTAL		188575.7	16372.2	25661.5

PAGE TYPE 10

YIELDS PER ACRE OF MANAGEO, EVEN-AGED STANOS BASEO CN PRECETERMINEO STANOAROS FOR
SITE INOEX 70., 20.-YEAR CUTTING CYCLE, OENSITY LEVEL 100.

WORKING GRCUP - PINE

	ENTIRE STAND BEFORE ANO AFTER THINNING							PERIODIC CUT AND MORTALITY				
STAND AGE (YEARS)	TREES NC.	BASAL AREA SO. FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU. FT.	MERCHANT-ABLE VOLUME CU. FT.	SAWTIMBER VOLUME M BO. FT.	TREES NO.	BASAL AREA SQ. FT.	TOTAL VOLUME CU. FT.	MERCHANT-ABLE VOLUME CU. FT.	SAWTIMBER VOLUME M BO. FT.
30.	1C00	126	4.8	25	1245	312.	0.C00					
30.	373	68	5.8	27	750	312.	0.000	627	58	495	0.	0.000
40.	370	96	6.9	36	1399	973.	0.000					
50.	365	121	7.8	44	2203	1789.	1.400					
50.	239	94	8.5	45	1748	1520.	1.400	126	27	455	269.	0.000
60.	237	114	9.4	51	2413	2203.	4.170					
70.	235	133	10.2	58	3229	2998.	8.250					
70.	154	100	10.9	59	2468	2308.	7.270	81	33	761	690.	.980
80.	154	117	11.8	65	3232	3038.	12.450					
90.	154	133	12.6	69	4007	3781.	15.350					
90.	104	1C0	13.3	70	3055	2891.	12.210	50	33	952	890.	3.140
100.	104	114	14.2	74	3717	3530.	15.950					
110.	104	129	15.1	78	4432	4221.	20.240					
110.	73	99	15.8	78	3437	3280.	16.130	31	30	995	941.	4.110
120.	73	112	16.8	82	4058	3883.	20.130					
130.	73	125	17.7	84	4671	4479.	24.240					
130.	54	100	18.4	85	3759	3609.	19.900	19	25	912	870.	4.340
140.	54	111	19.4	87	4309	4146.	23.800					
150.	54	121	20.3	89	4844	4668.	27.720					

PAGE TYPE 11

GROWING STOCK OF MANAGEO, REGULATEO, EVEN-AGEO STANOS
SITE INOEX 70., 2C.-YEAR CUTTING CYCLE
OENSITY LEVEL- 100. ANO 100.

WORKING CRCUP - PINE

VOLUMES PRESENT PER ACRE AT ENO CF EACH YEAR

MERCHANTABLE CUBIC FEET

	YEAR									
CECAOE	0	1	2	3	4	5	6	7	8	9
0	0.0	0.0	0.C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	312.0	378.1	444.2	510.3	576.4	642.5	708.6	774.7	840.8	906.9
4	973.0	1054.6	1136.2	1217.8	1299.4	1381.0	1462.6	1544.2	1625.8	1707.4
5	1520.0	1588.3	1656.6	1724.9	1793.2	1861.5	1929.8	1998.1	2066.4	2134.7
6	2203.0	2282.5	2362.0	2441.5	2521.0	2600.5	2680.0	2759.5	2839.0	2918.5
7	2308.0	2381.0	2454.0	2527.0	2600.0	2673.0	2746.0	2819.0	2892.0	2965.0
8	3038.0	3112.3	3186.6	3260.9	3335.2	3409.5	3483.8	3558.1	3632.4	3706.7
9	2891.0	2954.9	3018.8	3082.7	3146.6	3210.5	3274.4	3338.3	3402.2	3466.1
10	3530.0	3599.1	3668.2	3737.3	3806.4	3875.5	3944.6	4013.7	4082.8	4151.9
11	3280.0	3340.3	3400.6	3460.9	3521.2	3581.5	3641.8	3702.1	3762.4	3822.7
12	3883.0	3942.6	4002.2	4061.8	4121.4	4181.0	4240.6	4300.2	4359.8	4419.4
13	3609.0	3662.7	3716.4	3770.1	3823.8	3877.5	3931.2	3984.9	4038.6	4092.3
14	4146.0	4198.2	4250.4	4302.6	4354.8	4407.0	4459.2	4511.4	4563.6	4615.8
15	4668.0									

THOUSANOS OF BOARO FEET

0	0.000	C.000	0.00C	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.CC0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.C00	0.000
4	0.000	.140	.280	.420	.560	.700	.840	.980	1.120	1.260
5	1.400	1.677	1.954	2.231	2.508	2.785	3.062	3.339	3.616	3.893
6	4.170	4.578	4.986	5.394	5.802	6.210	6.618	7.026	7.434	7.842
7	7.270	7.788	8.306	8.824	9.342	9.860	10.378	10.896	11.414	11.932
8	12.450	12.740	13.030	13.320	13.610	13.900	14.190	14.480	14.770	15.060
9	12.210	12.584	12.958	13.332	13.706	14.080	14.454	14.828	15.202	15.576
10	15.950	16.379	16.808	17.237	17.666	18.095	18.524	18.953	19.382	19.811
11	16.130	16.530	16.930	17.330	17.730	18.130	18.530	18.930	19.330	19.730
12	20.130	20.541	20.952	21.363	21.774	22.185	22.596	23.007	23.418	23.829
13	19.900	20.290	20.680	21.070	21.460	21.850	22.240	22.630	23.020	23.410
14	23.800	24.192	24.584	24.976	25.368	25.760	26.152	26.544	26.936	27.328
15	27.720									

PAGE TYPE 12

DISTRIBUTION OF AREA AND GROWING STOCK GOALS

FOR SITE INDEX CLASS- 70., ROTATION- 130., AND 35532.6 ACRES OF THIS SITE CLASS AND GROUP

WORKING GROUP - PINE

AGE CLASS	ACRES IN CLASS	HUNDREDS OF CU. FT.	M BD. FT.
1- 10	2733.3	30339.4	16017.0
11- 20	2733.3	0.0	0.0
21- 30	2733.3	852.8	0.0
31- 40	2733.3	18464.7	0.0
41- 50	2733.3	38126.5	0.0
51- 60	2733.3	51813.4	7990.7
61- 70	2733.3	70279.5	17263.4
71- 80	2733.3	74058.2	27658.1
81- 90	2733.3	91774.0	37530.7
91-100	2733.3	88625.2	38995.7
101-110	2733.3	104300.6	48921.6
111-120	2733.3	98716.5	50101.0
121-130	2733.3	24872.9	12737.1
131-140	0.0	0.0	0.0
TOTALS	35532.6	692223.7	257215.3

PAGE TYPE 13

GROWING STOCK GOALS FOR WORKING CIRCLE

WORKING GROUP - PINE

BOGUS NATIONAL FOREST

SITE CLASS	ACRES	ROTATION AGE	CU. FT. TO BD. FT. LIMIT	CU. FT. TO ROTATION AGE	M BD. FT. ABOVE BD. FT. LIMIT
40.	30459.6	110.	64476.	255228.	64029.
50.	68066.4	130.	122508.	890443.	284131.
60.	77017.4	130.	120470.	1256453.	445646.
70.	35532.6	130.	57444.	692224.	257215.
TOTALS	212480.4		364898.	3094347.	1051022.

CUBIC FEET IN HUNDREDS. TOTAL AREA INCLUDES ANY LOW SITE ACRES INCORRECTLY CLASSED AS OPERABLE TYPES.

PAGE TYPE 14

CONVERSION OF AREAS TO STANDARD ACRES

WORKING GROUP - PINE

BOGUS NATIONAL FOREST

SITE INDEX CLASS	TOTAL YIELD PER ACRE M BD. FT.	ACRES IN SITE CLASS	REDUCTION FACTOR	AREA IN STANDARD ACRES	EQUIVALENT OF STANDARD ACRE IN SITE ACRES
40.	8.5	30459.6	.49679	15131.9	2.01294
50.	17.1	68066.4	1.00000	68066.4	1.00000
60.	26.6	77017.4	1.55523	119779.8	.64299
70.	31.5	35532.6	1.84044	65395.8	.54335
TOTALS		212480.4		268374.0	

SITE INDEX CLASS	TOTAL YIELD PER ACRE CU. FT.	ACRES IN SITE CLASS	REDUCTION FACTOR	AREA IN STANDARD ACRES	EQUIVALENT OF STANDARD ACRE IN SITE ACRES
40.	22.2	30459.6	.53329	16243.7	1.87517
50.	41.6	68066.4	1.00000	68066.4	1.00000
60.	57.5	77017.4	1.38308	106521.3	.72302
70.	70.0	35532.6	1.68229	59776.1	.59443
TOTALS		212480.4		250607.5	

PAGE TYPE 10

YIELDS PER ACRE OF MANAGED, EVEN-AGED STANDS BASED ON PREDETERMINED STANDARDS FOR SITE INDEX 70., 20.-YEAR CUTTING CYCLE, DENSITY LEVEL 90.

WORKING GROUP - SPRUCE

	ENTIRE STAND BEFORE AND AFTER THINNING							PERIODIC CUT AND MORTALITY				
STAND AGE (YEARS)	TREES NO.	BASAL AREA SQ. FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU. FT.	MERCHANTABLE VOLUME CU. FT.	SAWTIMBER VOLUME M BD. FT.	TREES NO.	BASAL AREA SQ. FT.	TOTAL VOLUME CU. FT.	MERCHANTABLE VOLUME CU. FT.	SAWTIMBER VOLUME M BD. FT.
30.	1550	110	3.6	28	1528	0.	0.000					
30.	472	50	4.4	28	704	0.	0.000	1078	60	824	0.	0.000
40.	467	80	5.6	35	1434	552.	0.000					
50.	465	110	6.6	40	2235	1492.	0.000					
50.	250	79	7.6	40	1598	1309.	0.000	215	31	637	183.	0.000
60.	248	100	8.6	47	2390	2135.	2.150					
70.	247	122	9.5	53	3265	3031.	5.760					
70.	156	90	10.3	53	2428	2284.	5.760	91	32	837	747.	0.000
80.	156	109	11.3	58	3190	3013.	10.330					
90.	156	127	12.2	63	3982	3772.	14.750					
90.	98	90	13.0	63	2845	2702.	11.260	58	37	1137	1070.	3.490
100.	98	106	14.1	66	3534	3366.	14.970					
110.	98	122	15.1	69	4238	4045.	18.800					
110.	66	90	15.8	69	3129	2991.	14.240	32	32	1109	1054.	4.560
120.	66	103	16.9	72	3715	3558.	17.450					
130.	66	117	18.0	74	4348	4172.	20.900					
130.	48	90	18.5	74	3345	3211.	16.210	18	27	1003	961.	4.690
140.	48	102	19.7	76	3895	3746.	19.160					
150.	48	113	20.8	78	4445	4280.	22.060					

PAGE TYPE 11

GROWING STOCK OF MANAGED, REGULATED, EVEN-AGED STANDS
SITE INDEX 70., 20.-YEAR CUTTING CYCLE
DENSITY LEVEL- 100. AND 90.

WORKING GROUP - SPRUCE

VOLUMES PRESENT PER ACRE AT END OF EACH YEAR

MERCHANTABLE CUBIC FEET

DECADE	YEAR 0	1	2	3	4	5	6	7	8	9
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	55.2	110.4	165.6	220.8	276.0	331.2	386.4	441.6	496.8
4	552.0	646.0	740.0	834.0	928.0	1022.0	1116.0	1210.0	1304.0	1398.0
5	1309.0	1391.6	1474.2	1556.8	1639.4	1722.0	1804.6	1887.2	1969.8	2052.4
6	2135.0	2224.6	2314.2	2403.8	2493.4	2583.0	2672.6	2762.2	2851.8	2941.4
7	2284.0	2356.9	2429.8	2502.7	2575.6	2648.5	2721.4	2794.3	2867.2	2940.1
8	3013.0	3088.9	3164.8	3240.7	3316.6	3392.5	3468.4	3544.3	3620.2	3696.1
9	2702.0	2768.4	2834.8	2901.2	2967.6	3034.0	3100.4	3166.8	3233.2	3299.6
10	3366.0	3433.9	3501.8	3569.7	3637.6	3705.5	3773.4	3841.3	3909.2	3977.1
11	2991.0	3047.7	3104.4	3161.1	3217.8	3274.5	3331.2	3387.9	3444.6	3501.3
12	3558.0	3619.4	3680.8	3742.2	3803.6	3865.0	3926.4	3987.8	4049.2	4110.6
13	3211.0	3264.5	3318.0	3371.5	3425.0	3478.5	3532.0	3585.5	3639.0	3692.5
14	3746.0	3799.4	3852.8	3906.2	3959.6	4013.0	4066.4	4119.8	4173.2	4226.6
15	4280.0									

THOUSANDS OF BOARD FEET

0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	.215	.430	.645	.860	1.075	1.290	1.505	1.720	1.935
6	2.150	2.511	2.872	3.233	3.594	3.955	4.316	4.677	5.038	5.399
7	5.760	6.217	6.674	7.131	7.588	8.045	8.502	8.959	9.416	9.873
8	10.330	10.772	11.214	11.656	12.098	12.540	12.982	13.424	13.866	14.308
9	11.260	11.631	12.002	12.373	12.744	13.115	13.486	13.857	14.228	14.599
10	14.970	15.353	15.736	16.119	16.502	16.885	17.268	17.651	18.034	18.417
11	14.240	14.561	14.882	15.203	15.524	15.845	16.166	16.487	16.808	17.129
12	17.450	17.795	18.140	18.485	18.830	19.175	19.520	19.865	20.210	20.555
13	16.210	16.505	16.800	17.095	17.390	17.685	17.980	18.275	18.570	18.865
14	19.160	19.450	19.740	20.030	20.320	20.610	20.900	21.190	21.480	21.770
15	22.060									

PAGE TYPE 12

DISTRIBUTION OF AREA AND GROWING STOCK GOALS

FOR SITE INDEX CLASS- 70., ROTATION- 110., AND 10284.5 ACRES OF THIS SITE CLASS AND GROUP

WORKING GROUP - SPRUCE

AGE CLASS	ACRES IN CLASS	HUNDREDS OF CU. FT.	M BD. FT.
0	935.0		
1- 10	935.0	0.0	0.0
11- 20	935.0	0.0	0.0
21- 30	935.0	0.0	0.0
31- 40	935.0	2838.5	0.0
41- 50	935.0	9823.5	0.0
51- 60	935.0	16486.0	683.4
61- 70	935.0	23870.2	3866.5
71- 80	935.0	25103.0	7735.3
81- 90	935.0	31072.6	11604.6
91-100	935.0	28676.8	12435.3
101-110	0.0	0.0	0.0
111-120	0.0	0.0	0.0
TOTALS	10284.5	137870.6	36325.2

AGE CLASS ZERO REPRESENTS CLEARCUT ACRES NOT YET REFORESTED BECAUSE OF DELAY OF 10. YEARS EXPECTED AFTER SCHEDULED REGENERATION CUTTING.

PAGE TYPE 13

GROWING STOCK GOALS FOR WORKING CIRCLE

WORKING GROUP - SPRUCE

BOGUS NATIONAL FOREST

SITE CLASS	ACRES	ROTATION AGE	CU. FT. TO BD. FT. LIMIT	CU. FT. TO ROTATION AGE	M BD. FT. ABOVE BD. FT. LIMIT
50.	2429.3	90.	7269.	11881.	642.
60.	5205.6	110.	13706.	55014.	11468.
70.	10284.5	110.	21627.	137871.	36325.
TOTALS	18128.9		42602.	204765.	48435.

CUBIC FEET IN HUNDREDS. TOTAL AREA INCLUDES ANY LOW SITE ACRES INCORRECTLY CLASSED AS OPERABLE TYPES.

PAGE TYPE 14

CONVERSION OF AREAS TO STANDARD ACRES

WORKING GROUP - SPRUCE

BOGUS NATIONAL FOREST

SITE INDEX CLASS	TOTAL YIELD PER ACRE M BD. FT.	ACRES IN SITE CLASS	REDUCTION FACTOR	AREA IN STANDARD ACRES	EQUIVALENT OF STANDARD ACRE IN SITE ACRES
50.	5.1	2429.3	.35090	852.4	2.84980
60.	14.4	5205.6	1.00000	5205.6	1.00000
70.	22.3	10284.5	1.54577	15897.4	.64693
TOTALS		18128.9		21955.5	

SITE INDEX CLASS	TOTAL YIELD PER ACRE CU. FT.	ACRES IN SITE CLASS	REDUCTION FACTOR	AREA IN STANDARD ACRES	EQUIVALENT OF STANDARD ACRE IN SITE ACRES
50.	23.4	2429.3	.51566	1252.7	1.93926
60.	45.3	5205.6	1.00000	5205.6	1.00000
70.	58.6	10284.5	1.29290	13296.8	.77346
TOTALS		18128.9		19755.1	

APPENDIX 3

Alternative Outputs

Source programs for MAPS and AREA1 are listed below. Each program is followed by the type 5 pages produced. Subroutine MAPS produces two type 5 pages for each compartment if maps are desired, and a single type 5 page per compartment if map output is suppressed. Type 6 pages produced by MAPS and AREA1 are not reproduced because they do not differ in format from the page type 6 of AREA2 in Appendix 2.

```
      SUBROUTINE MAPS
C
C TO COMPUTE AREAS FROM TYPE ANO SUBCOMPARTMENT MAPS.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,DATE(3),OLEV(3),FINL(3),FORET(3),GRBD(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWO(3),S
     7LAND,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),DELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,PDCFR(5,12),PDCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBO(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PROD(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BDMAI(3),CUMAI(3),PAIBO(3),PAICU(3),OBHO
     3,OENO,REST,OBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      DIMENSION KSUB(36,36),KTYP(36,36),ARESC(30),ARETY(20),CVR(20),SUBT
     1Y(30),UNIT(30),GRUP(3)
      REAO (5,1) MAP,SCALE
    1 FORMAT (I4,F6.4)
C
C REPEAT LOOP FOR EACH COMPARTMENT.
C
      OO 200 KOL=1,NCMP
C
C INITIALIZE VARIABLES APPLICABLE TO A COMPARTMENT.
C
      DO 4 I=1,30
      ARESC(I) = 0.0
      SUBTY(I) = 0.0
    4 UNIT(I) = 0.0
      OO 5 I=1,3
    5 GRUP(I) = 0.0
      OO 6 I=1,36
      DO 6 J=1,36
      KSUB(I,J) = 0
    6 KTYP(I,J) = 0
      DO 7 I=1,20
      ARETY(I) = 0.0
      CVR(I) = 0.0
    7 CONTINUE
      ARECP = 0.0
      BARE = 0.0
      SARSC = 0.0
C
C READ DATA FOR A COMPARTMENT.
C LOGICAL UNIT 3 HOLDS THE TAPE WITH MAPS IF TAPE IS USEO.
C
      READ (3,11) KBK,KOMP,NROW
   11 FORMAT (3I4)
      READ (3,12) ((KTYP(I,J),J=1,36),I=1,NROW)
```

```
   12 FORMAT (36I2)
      READ (3,12) ((KSUB(I,J),J=1,36),I=1,NROW)
C
C COMPUTE TYPE AREAS AND TOTAL AREA.
C
      DO 20 I=1,NROW
      DO 19 J=1,36
      IF(KTYP(I,J) .LE. 0) GO TO 19
      MNK = KTYP(I,J)
      CVR(MNK) = CVR(MNK) + 1.0
   19 CONTINUE
   20 CONTINUE
      DO 21 I=1,20
      ARETY(I) = CVR(I) * SCALE
      SARETY(KBK,I) = SARETY(KBK,I) + ARETY(I)
      ARECP = ARECP + ARETY(I)
   21 CONTINUE
C
C COMPUTE AREA OF EACH WORKING GROUP AND DEFORESTED AREA.
C
      DO 22 I=1,5
      GRUP(1) = GRUP(1) + ARETY(I)
      GRUP(2) = GRUP(2) + ARETY(I+5)
   22 CONTINUE
      BARE = ARETY(11) + ARETY(12)
      ACBAR(KBK) = ACBAR(KBK) + BARE
      ACSP(1,KBK) = ACSP(1,KBK) + GRUP(1)
      ACSP(2,KBK) = ACSP(2,KBK) + GRUP(2)
      ARBK(KBK) = ARBK(KBK) + ARECP
C
C COMPUTE SUBCOMPARTMENT AREAS AND TYPES.
C
      DO 25 I=1,NWGP
      IF(GRUP(I) .GT. 0.0) GO TO 30
   25 CONTINUE
      IF(BARE .GT. 0.0) GO TO 30
      MNK = 0
      GO TO 38
   30 DO 32 I=1,NROW
      DO 31 J=1,36
      IF(KSUB(I,J) .LE. 0) GO TO 31
      NOS = KSUB(I,J)
      UNIT(NOS) = UNIT(NOS) + 1.0
      IF(SUBTY(NOS) .NE. 0.0) GO TO 31
      SUBTY(NOS) = KTYP(I,J)
   31 CONTINUE
   32 CONTINUE
      DO 33 I=1,30
      ARESC(I) = UNIT(I) * SCALE
      SARSC = SARSC + ARESC(I)
   33 CONTINUE
C
C COUNT NUMBER OF SUBCOMPARTMENTS IN A BLOCK.
C COMPUTE INDEX FOR PRINTING SUBCOMPARTMENT AREAS.
C
      DO 35 I=1,30
      MNK = I
      IF(ARESC(I) .EQ. 0.0) GO TO 36
   35 CONTINUE
   36 NSBK(KBK) = NSBK(KBK) + MNK - 1
      IF(ARESC(30) .GT. 0.0) NSBK(KBK) = NSBK(KBK) + 1.0
      TEM = MNK
      MNK = TEM * 0.5
C
C PRINT TYPE AND SUBCOMPARTMENT MAPS, IF DESIRED.
C
   38 IF(MAP .EQ. 0) GO TO 100
C
C CONVERT MAP CODES TO DISPLAY CODE AND RIGHT JUSTIFY. OCTAL CODE WILL
C VARY WITH MODEL OF COMPUTER.
C
      DO 44 I=1,36
      DO 44 J=1,36
      IF(KTYP(I,J) .LT. 1) GO TO 41
      IF(KTYP(I,J) .LE. 9) GO TO 42
      N = 0
   40 N = N + 1
      KTYP(I,J) = KTYP(I,J) - 10
      IF(KTYP(I,J) .GT. 9) GO TO 40
      GO TO 43
   41 KTYP(I,J) = 5555B
      GO TO 44
   42 KTYP(I,J) = KTYP(I,J) + 2907
      GO TO 44
   43 KTYP(I,J) = KTYP(I,J) + 27
      KTYP(I,J) = KTYP(I,J) + (N * 64 + 1728)
   44 CONTINUE
      DO 49 I=1,36
      DO 49 J=1,36
      IF(KSUB(I,J) .LT. 1) GO TO 46
      IF(KSUB(I,J) .LE. 9) GO TO 47
      N = 0
   45 N = N + 1
      KSUB(I,J) = KSUB(I,J) - 10
      IF(KSUB(I,J) .GT. 9) GO TO 45
      GO TO 48
   46 KSUB(I,J) = 5555B
      GO TO 49
   47 KSUB(I,J) = KSUB(I,J) + 2907
      GO TO 49
   48 KSUB(I,J) = KSUB(I,J) + 27
      KSUB(I,J) = KSUB(I,J) + (N * 64 + 1728)
   49 CONTINUE
C
C PRINT PAGE TYPE 5 - TYPE AND SUBCOMPARTMENT MAPS AND AREAS.
C
C PRINT TYPE MAP AND TYPE AREAS.
C
      WRITE (6,79)
   79 FORMAT (1H1,/,62X,11HPAGE TYPE 5)
      WRITE (6,80) (FORET(I),I=1,3),KOMP,KBK
   80 FORMAT (1H ,6X,3A8,19X,27HTYPE MAP OF COMPARTMENT NO.,I4,25X,9HBLO
     1CK NO.,I2,/)
      DO 82 I=1,NROW
      WRITE (6,81) (KTYP(I,J),J=1,36)
   81 FORMAT (1H ,28X,36R2)
   82 CONTINUE
      WRITE (6,83)
   83 FORMAT (1H0,31X,10HCOVER TYPE,9X,5HACRES,4X,1H*,7X,10HCOVER TYPE,9
     1X,5HACRES,/)
      DO 85 I=1,10
      J = I + 10
      WRITE (6,84) I,TYPNM(I),ARETY(I),J,TYPNM(J),ARETY(J)
   84 FORMAT (1H ,28X,I2,2X,A10,4X,F9.1,4X,1H*,4X,I2,2X,A10,4X,F9.1)
   85 CONTINUE
      WRITE (6,86) ARECP
   86 FORMAT (1H0,70X,10HTOTAL AREA,2X,F9.1)
      WRITE (6,87) GRUP(1),BARE,GRUP(2)
   87 FORMAT (1H ,15X,22HACRES IN WORKING GROUP/1H ,21X,12HPINE GROUP -,
     1F9.1,20X,18HDEFORESTED ACRES -,F9.1/1H ,21X,14HSPRUCE GROUP -,F7.1
     2)
C
C PRINT SUBCOMPARTMENT MAPS AND RELATED DATA.
C
      IF(MNK .EQ. 0) GO TO 200
      WRITE (6,79)
      WRITE (6,88) (FORET(I),I=1,3),KOMP,KBK
   88 FORMAT (1H ,7X,3A8,14X,37HSUBCOMPARTMENT MAP OF COMPARTMENT NO.,I4
     1,20X,9HBLOCK NO.,I2,/)
      DO 89 I=1,NROW
      WRITE (6,81) (KSUB(I,J),J=1,36)
   89 CONTINUE
      WRITE (6,90)
   90 FORMAT (1H0,16X,8HSUBCOMP.,6X,10HCOVER TYPE,10X,5HACRES,4X,1H*,4X,
     18HSUBCOMP.,6X,10HCOVER TYPE,10X,5HACRES,/)
      DO 94 I=1,MNK
      J = I + MNK
      MOL = SUBTY(I)
      JAM = SUBTY(J)
      IF(MOL .EQ. 0) GO TO 95
      IF(JAM .EQ. 0) GO TO 92
      WRITE (6,91) I,SUBTY(I),TYPNM(MOL),ARESC(I),J,SUBTY(J),TYPNM(JAM),
     1ARESC(J)
   91 FORMAT (1H ,19X,I2,6X,F3.0,2X,A10,4X,F9.1,4X,1H*,7X,I2,6X,F3.0,2X,
     1A10,4X,F9.1)
      GO TO 94
   92 WRITE (6,93) I,SUBTY(I),TYPNM(MOL),ARESC(I)
   93 FORMAT (1H ,19X,I2,6X,F3.0,2X,A10,4X,F9.1,4X,1H*)
   94 CONTINUE
   95 WRITE (6,96) SARSC
   96 FORMAT (1H0,82X,10HTOTAL AREA,2X,F9.1)
      WRITE (6,87) GRUP(1),BARE,GRUP(2)
      GO TO 200
C
C PRINT PAGE TYPE 5 - AREAS ONLY IF MAPS NOT DESIRED.
C
  100 WRITE (6,79)
      WRITE (6,101) (FORET(I),I=1,3),KOMP,KBK
  101 FORMAT (1H0,6X,3A8,18X,29HTYPE AREAS OF COMPARTMENT NO.,I4,24X,9HB
     1LOCK NO.,I2)
      WRITE (6,83)
      DO 102 I=1,10
      J = I + 10
      WRITE (6,84) I,TYPNM(I),ARETY(I),J,TYPNM(J),ARETY(J)
  102 CONTINUE
      WRITE (6,86) ARECP
      IF(MNK .EQ. 0) GO TO 200
      WRITE (6,103) (FORET(I),I=1,3),KOMP,KBK
  103 FORMAT (1H0,//,7X,3A8,16X,34HSUBCOMPARTMENTS OF COMPARTMENT NO.,I4
     1,21X,9HBLOCK NO.,I2)
      WRITE (6,90)
      DO 106 I=1,MNK
      J = I + MNK
      MOL = SUBTY(I)
      JAM = SUBTY(J)
      IF(MOL .EQ. 0) GO TO 107
      IF(JAM .EQ. 0) GO TO 104
      WRITE (6,91) I,SUBTY(I),TYPNM(MOL),ARESC(I),J,SUBTY(J),TYPNM(JAM),
     1ARESC(J)
      GO TO 106
  104 WRITE (6,93) I,SUBTY(I),TYPNM(MOL),ARESC(I)
  106 CONTINUE
  107 WRITE (6,96) SARSC
      WRITE (6,87) GRUP(1),BARE,GRUP(2)
C
C WHEN STAND AREAS ARE KNOWN AND INVENTORY DATA REFER TO THE STAND,
C VALUES OF ARESC(I), KBK, AND KOMP MAY BE EXTRACTED AT THIS POINT FOR
C MACHINE ADDITION OF ARESC(I) TO APPROPRIATE INVENTORY RECORDS.
C
  200 CONTINUE
C
C GET WORKING CIRCLE TOTALS FROM BLOCK TOTALS.
C
      DO 250 I=1,NBK
      DO 250 J=1,20
  250 STYP(J) = STYP(J) + SARETY(I,J)
      DO 251 I=1,NBK
      SBARB = SBARB + SARETY(I,11)
      SBARG = SBARG + SARETY(I,12)
      SLAND = SLAND + ARBK(I)
      NSUB = NSUB + NSBK(I)
      DO 251 J=1,NWGP
  251 SMSP(J) = SMSP(J) + ACSP(J,I)
      SBARE = SBARB + SBARG
C
C PRINT PAGE TYPE 6 - SUMMARY OF BLOCK AND WORKING CIRCLE AREAS.
C
      WRITE (6,299)
```

```
299 FORMAT (1H1,////,59X,11HPAGE TYPE 6)
    WRITE (6,300)
300 FORMAT (1H0,44X,40HTOTAL AREAS OF BLOCKS AND WORKING CIRCLE)
    WRITE (6,301) (FORET(I),I=1,3)
301 FORMAT (1H ,53X,3A8)
    WRITE (6,302)
302 FORMAT (1H0,//,5X,5HBLOCK,10X,5HTOTAL,8X,6HNUMBER,8X,41H------ PLA
   1NTABLE ACRES FOREST SOIL ------,16X,23HFOREST AND REGENERATING)
    WRITE (6,303)
303 FORMAT (1H ,5X,3HNO.,11X,5HACRES,7X,8HSUBCOMPT,7X,6HBRUSHY,12X,6HG
   1RASSY,12X,5HTOTAL,16X,4HPINE,13X,6HSPRUCE,//)
    DO 305 I=1,NBK
    WRITE (6,304)I,ARBK(I),NSBK(I),SARETY(I,11),SARETY(I,12),ACBAR(I),
   1ACSP(1,I),ACSP(2,I)
304 FORMAT (1H0,5X,I2,8X,F10.1,7X,I5,6X,F10.1,8X,F10.1,7X,F10.1,11X,F1
   10.1,8X,F10.1)
305 CONTINUE
    WRITE (6,306) SLAND,NSUB,SBARB,SBARG,SBARE,SMSP(1),SMSP(2)
306 FORMAT (1H0,//,5X,5HTOTAL,6X,F10.1,7X,I5,6X,F10.1,8X,F10.1,7X,F10.
   11,11X,F10.1,8X,F10.1)
    WRITE (6,307)
307 FORMAT (1H0,///,55X,21HDESIGNATIONS OF TYPES)
    DO 309 I=1,10
    J = I + 10
    WRITE (6,308) I,TYPNM(I),J,TYPNM(J)
308 FORMAT (1H0,43X,I2,4X,A10,6X,1H*,6X,I2,4X,A10)
309 CONTINUE
    RETURN
    END
```

PAGE TYPE 5

BOGUS NATIONAL FOREST — TYPE MAP OF COMPARTMENT NO. 206 — BLOCK NO. 3

```
                       5 5
             5 5 5 5 5 5 5               3 3171717 3 3
   5 5 5 5 5 5 5 5 5 5 5 5 5       5 5 5 3 3171717 3 3 3 3
 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5   3 3 5 5 5 51717171616 3 3 3 3
 3 5 5 5 5 5 5 5 5 5 3 5 5 5 5 5 3 5 5 5 5 5 5 3 3 3 3 31616171717
 3 5 5 5 5 5 5 5 5 3 3 5 5 5 5 5 5 5 5 5 5 3 3 3 4 4 3 3 3 4 31717
   3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 3 3 3 3 3 3 3 4 4 3 3 317
   3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 3 3 3 3 3 3 3
     5 5 5 5 5 5 5 5 5 4 4 4 4 5 5 5 5 3 3 3 3 5 3
       5 5 5 5 5 5 5 5 3 3 4 4 5 5 5 5 3     5
       5 5 5 5 5 5 5 5 5 3 4 4 5 5   5
         5 5 5 5 5 5 5 5     4
           5     5
```

	COVER TYPE	ACRES	*		COVER TYPE	ACRES
1	PIN 0-30	0.0	*	11	DEFOREST-B	0.0
2	PIN 31-50	0.0	*	12	DEFOREST-G	0.0
3	PIN 51-100	280.0	*	13	RECREATION	0.0
4	PIN 101-40	62.2	*	14	BARREN	0.0
5	PIN 141+	742.2	*	15	BRUSHLAND	0.0
6	SPR 0-30	0.0	*	16	RANGE-HERB	17.8
7	SPR 31-50	0.0	*	17	PRIVATE	66.7
8	SPR 51	0.0	*	18		0.0
9	SPR 101-40	0.0	*	19		0.0
10	SPR 141+	0.0	*	20		0.0

TOTAL AREA 1168.9

ACRES IN WORKING GROUP
PINE GROUP - 1084.4
SPRUCE GROUP - 0.0

DEFORESTED ACRES - 0.0

PAGE TYPE 5

BOGUS NATIONAL FOREST — SUBCOMPARTMENT MAP OF COMPARTMENT NO. 206 — BLOCK NO. 3

```
                       1 1
             2 2 2 1 1 1 1               3 3       4 4
   5 5 5 5 5 2 2 2 1 1 1 1 1       6 6 6 3 3       4 4 4 4
 7 5 5 5 5 5 2 2 2 2 1 1 1 1 1   8 8 6 6 6 6           4 4 4 4
 7 5 5 5 5 2 2 2 2 2 9 1 1 1 1 1 8 6 6 6 6 6 61010 4 4 4
 7 5 5 5 5 2 2 2 2 9 9 1 1 1 1 1 6 6 6 6 61010101111 4 4 41213
   7 5 5 5 2 2 2 21414 1 1 1 1 6 6 6 6 6 610101010 4 4 41212131313
   7 5 51414 214141414 1 1 1 1 6 6 6 6 6101010101010 4
     5 5141414141414141415151515 6 6 6 6101010101610
      141414141414141417171515 6 6 6 610    16
      141414141414141414171515 6 6   6
        1414141414141414    15
          14    14
```

SUBCOMP.	COVER TYPE	ACRES	*	SUBCOMP.	COVER TYPE	ACRES
1	5. PIN 141+	151.1	*	10	3. PIN 51-100	93.3
2	5. PIN 141+	106.7	*	11	4. PIN 101-40	8.9
3	3. PIN 51-100	17.8	*	12	4. PIN 101-40	13.3
4	3. PIN 51-100	88.9	*	13	3. PIN 51-100	17.8
5	5. PIN 141+	111.1	*	14	5. PIN 141+	186.7
6	5. PIN 141+	177.8	*	15	4. PIN 101-40	40.0
7	3. PIN 51-100	22.2	*	16	5. PIN 141+	8.9
8	3. PIN 51-100	13.3	*	17	3. PIN 51-100	13.3
9	3. PIN 51-100	13.3	*			

TOTAL AREA 1084.4

ACRES IN WORKING GROUP
PINE GROUP - 1084.4
SPRUCE GROUP - 0.0

DEFORESTED ACRES - 0.0

PAGE TYPE 5

BOGUS NATIONAL FOREST TYPE AREAS OF COMPARTMENT NO. 206 BLOCK NO. 3

	COVER TYPE	ACRES	*		COVER TYPE	ACRES
1	PIN 0-30	0.0	*	11	OEFOREST-B	0.0
2	PIN 31-50	0.0	*	12	DEFOREST-G	0.0
3	PIN 51-100	280.0	*	13	RECREATION	0.0
4	PIN 101-40	62.2	*	14	BARREN	0.0
5	PIN 141+	742.2	*	15	BRUSHLANO	0.0
6	SPR 0-30	0.0	*	16	RANGE-HERB	17.8
7	SPR 31-50	0.0	*	17	PRIVATE	66.7
8	SPR 51	0.0	*	18		0.0
9	SPR 101-40	0.0	*	19		0.0
10	SPR 141+	0.0	*	20		0.0

TOTAL AREA 1168.9

BOGUS NATIONAL FOREST SUBCOMPARTMENTS OF COMPARTMENT NO. 206 BLOCK NO. 3

SUBCOMP.	COVER TYPE	ACRES	*	SUBCOMP.	COVER TYPE	ACRES
1	5. PIN 141+	151.1	*	10	3. PIN 51-100	93.3
2	5. PIN 141+	106.7	*	11	4. PIN 101-40	8.9
3	3. PIN 51-100	17.8	*	12	4. PIN 101-40	13.3
4	3. PIN 51-100	88.9	*	13	3. PIN 51-100	17.8
5	5. PIN 141+	111.1	*	14	5. PIN 141+	186.7
6	5. PIN 141+	177.8	*	15	4. PIN 101-40	40.0
7	3. PIN 51-100	22.2	*	16	5. PIN 141+	8.9
8	3. PIN 51-100	13.3	*	17	3. PIN 51-100	13.3
9	3. PIN 51-100	13.3	*			

TOTAL AREA 1084.4

ACRES IN WORKING GROUP
PINE GROUP - 1084.4
SPRUCE GROUP - 0.0

OEFORESTEO ACRES - 0.0

```
      SUBROUTINE AREA1
C
C TO COMPUTE AREAS FOR WORKING CIRCLE FROM TOTAL AREA OF EACH TYPE IN
C EACH COMPARTMENT.
C
      COMMON ABFAG(3,15),ACBAR(5),ACSI(3,5,10),ACSP(3,5),ALLCF(3,10),AMC
     1AG(3,15),ANCUT(3,10),ARBK(5),AREA(3,10),BARSI(5,10),BFAGE(3,15),BF
     2TH(5,12),BFMRCH,CFAGE(3,15),CFBF(3,10),CMTH(5,12),COMBF(3),COMCU,C
     3UTA(5,12),CUTB(5,12),CYCL,OATE(3),OLEV(3),FINL(3),FORET(3),GRBO(3,
     45,15),GRMC(3,5,15),GROWB(3),GROWC(3),GVLBF(3),GVLCU(3),MIN,NBK,NCM
     5P,NSBK(5),NSI(3),NSUB,OPEN(5,12),POOR(3),PRET,RAGE(3,10),RINT,ROTA
     6,SARETY(5,20),SARSP(3),SBARB,SBARE,SBARG,SBF(3),SHELT(3),SHWO(3),S
     7LANO,SLVG(5,12),SMC(3),SMSP(3),STYP(20),SUBBF(3,10),SUBCF(3,10),SU
     8MCF(3),THIN(3),TMBR,TMPO,TYPNM(20),OELAY(3),ACFNL(3,5,15),ACRGN(3,
     95,15),TIME,POCFR(5,12),POCFN(5,12),OPCU(3),FNCU(3),CUINT(3),ACINT(
     13),FNBO(3),BFINT(3),OPBO(3),TEM,MNK,KNO,FCTR(2),PROO(2),KAK,VOM(2)
     2,AOJ(3),ALOWC(3),ALWBF(3),BOMAI(3),CUMAI(3),PAIBO(3),PAICU(3),OBHO
     3,OENO,REST,OBHT,BAST,NWGP,HELP(5,12),BA(2)
C
      OIMENSION ARETY(20),GRUP(3)
      KOUNT = 0
      OO 29 KOL=1,NCMP
C
C INITIALIZE VARIABLES APPLICABLE TO A COMPARTMENT.
C
      ARECP = 0.0
      BARE = 0.0
      OO 1 I=1,3
    1 GRUP(I) = 0.0
C
C REAO AREA OF EACH TYPE, ONE COMPARTMENT AT A TIME.
C
      REAO (5,5) KBK,KOMP
    5 FORMAT (2I4)
      REAO (5,6) (ARETY(I),I=1,20)
    6 FORMAT (10F8.1)
C
C SUM AREAS OF TYPES TO GET COMPARTMENT ANO BLOCK TOTALS.
C
      OO 15 I=1,20
      SARETY(KBK,I) = SARETY(KBK,I) + ARETY(I)
      ARECP = ARECP + ARETY(I)
   15 CONTINUE
      OO 16 I=1,5
      J = I + 5
      GRUP(1) = GRUP(1) + ARETY(I)
      GRUP(2) = GRUP(2) + ARETY(J)
   16 CONTINUE
      BARE = ARETY(11) + ARETY(12)
      ACBAR(KBK) = ACBAR(KBK) + BARE
      OO 17 I=1,NWGP
   17 ACSP(I,KBK) = ACSP(I,KBK) + GRUP(I)
      ARBK(KBK) = ARBK(KBK) + ARECP
C
C PRINT PAGE TYPE 5 - AREAS OF TYPES AND WORKING GROUPS BY COMPARTMENT.
C KOUNT CONTROLS PRINTER TO GET 3 COMPARTMENTS PER PAGE.
C
      KOUNT = KOUNT + 1
      IF(KOUNT .GT. 1) GO TO 21
      WRITE (6,19)
   19 FORMAT (1H1,/,62X,11HPAGE TYPE 5)
      WRITE (6,20) (FORET(I),I=1,3),KOMP,KBK
   20 FORMAT (1H0,6X,3A8,18X,29HTYPE AREAS OF COMPARTMENT NO.,I4,24X,9HB
     1LOCK NO.,I2)
      GO TO 23
   21 WRITE (6,22) (FORET(I),I=1,3),KOMP,KBK
   22 FORMAT (1H0,/,7X,3A8,18X,29HTYPE AREAS OF COMPARTMENT NO.,I4,24X,9
     1HBLOCK NO.,I2)
   23 WRITE (6,24)
   24 FORMAT (1H0,31X,10HCOVER TYPE,9X,5HACRES,4X,1H*,7X,10HCOVER TYPE,9
     1X,5HACRES,/)
      OO 26 I=1,10
      J = I + 10
      WRITE (6,25) I,TYPNM(I),ARETY(I),J,TYPNM(J),ARETY(J)
   25 FORMAT (1H ,28X,I2,2X,A10,4X,F9.1,4X,1H*,4X,I2,2X,A10,4X,F9.1)
   26 CONTINUE
      WRITE (6,27) ARECP
   27 FORMAT (1H0,70X,10HTOTAL AREA,2X,F9.1)
      WRITE (6,28) GRUP(1),GRUP(2),BARE
   28 FORMAT (1H0,18X,12HPINE GROUP -,F9.1,8X,14HSPRUCE GROUP -,F9.1,5X,
     118HOEFORESTEO ACRES -,F9.1)
      IF(KOUNT .GE. 3) KOUNT = 0
   29 CONTINUE
C
C GET WORKING CIRCLE TOTALS FROM BLOCK TOTALS.
C
      OO 40 I=1,NBK
      OO 40 J=1,20
   40 STYP(J) = STYP(J) + SARETY(I,J)
      OO 41 I=1,NBK
      SBARB = SBARB + SARETY(I,11)
      SBARG = SBARG + SARETY(I,12)
      SLANO = SLANO + ARBK(I)
      OO 41 J=1,NWGP
      SMSP(J) = SMSP(J) + ACSP(J,I)
   41 CONTINUE
      SBARE = SBARB + SBARG
C
C PRINT PAGE TYPE 6 - SUMMARY OF AREAS BY BLOCK ANO WORKING CIRCLE.
C
      WRITE (6,59)
   59 FORMAT (1H1,////,59X,11HPAGE TYPE 6)
      WRITE (6,60)
   60 FORMAT (1H0,44X,40HTOTAL AREAS OF BLOCKS ANO WORKING CIRCLE)
      WRITE (6,61) (FORET(I),I=1,3)
   61 FORMAT (1H ,53X,3A8)
```

```
      WRITE (6,62)
   62 FORMAT (1HO,//,4X,5H8LOCK,10X,5HTOTAL,14X,44H****** PLANTABLE ACRE
     1S FOREST SOIL *********,19X,23HFOREST ANO REGENERATING)
      WRITE (6,63)
   63 FORMAT (1H ,4X,3HNO.,11X,5HACRES,14X,6H8RUSHY,13X,6HGRASSY,I4X,5HT
     1OTAL,19X,4HPINE,13X,6HSPRUCE,//)
      OO 65 I=I,N8K
      WRITE (6,64) I,ARBK(I),SARETY(I,11),SARETY(I,12),AC8AR(I),ACSP(1,1
     1),ACSP(2,I)
   64 FORMAT (1HO,4X,I2,8X,F10.1,10X,F10.1,9X,F10.1,9X,F10.1,13X,F10.I,9
     1X,F10.1)
   65 CONTINUE
      WRITE (6,66) SLANO,SBAR8,SBARG,S8ARE,SMSP(1),SMSP(2)
   66 FORMAT (1HO,//,4X,5HTOTAL,6X,F10.1,10X,FI0.1,9X,F10.1,9X,F10.1,13X
     1,F10.1,9X,F10.1)
      WRITE (6,67)
   67 FORMAT (1HO,///,55X,21HOESIGNATIONS OF TYPES)
      OO 69 I=1,10
      J = I + 10
      WRITE (6,68) I,TYPNM(I),J,TYPNM(J)
   68 FORMAT (IHO,43X,I2,4X,AI0,6X,1H*,6X,12,4X,A10)
   69 CONTINUE
      RETURN
      ENO
```

PAGE TYPE 5

BOGUS NATIONAL FOREST — TYPE AREAS OF COMPARTMENT NO. 1 — BLOCK NO. 1

	COVER TYPE	ACRES	*		COVER TYPE	ACRES
1	PIN 0-30	0.0	*	11	OEFOREST-8	0.0
2	PIN 31-50	342.2	*	12	OEFOREST-G	0.0
3	PIN 51-100	84.4	*	13	RECREATION	0.0
4	PIN 101-40	537.8	*	14	8ARREN	8.9
5	PIN 141+	53.3	*	15	BRUSHLANO	0.0
6	SPR 0-30	0.0	*	16	RANGE-HERB	17.8
7	SPR 31-50	0.0	*	17	PRIVATE	231.1
8	SPR 51	0.0	*	18		-0.0
9	SPR 101-40	0.0	*	19		-0.0
10	SPR 141+	0.0	*	20		-0.0
					TOTAL AREA	1275.5

PINE GROUP - 1017.7 SPRUCE GROUP - 0.0 OEFORESTEO ACRES - 0.0

BOGUS NATIONAL FOREST — TYPE AREAS OF COMPARTMENT NO. 2 — BLOCK NO. 1

	COVER TYPE	ACRES	*		COVER TYPE	ACRES
1	PIN 0-30	0.0	*	11	OEFOREST-B	40.0
2	PIN 31-50	484.4	*	12	OEFOREST-G	0.0
3	PIN 51-100	71.1	*	13	RECREATION	0.0
4	PIN 101-40	528.9	*	14	8ARREN	40.0
5	PIN 141+	8.9	*	15	8RUSHLANO	0.0
6	SPR 0-30	0.0	*	16	RANGE-HERB	0.0
7	SPR 31-50	0.0	*	17	PRIVATE	173.3
8	SPR 51	0.0	*	18		-0.0
9	SPR 101-40	0.0	*	19		-0.0
10	SPR 141+	0.0	*	20		-0.0
					TOTAL AREA	1346.6

PINE GROUP - 1093.3 SPRUCE GROUP - 0.0 OEFORESTEO ACRES - 40.0

8OGUS NATIONAL FOREST — TYPE AREAS OF COMPARTMENT NO. 3 — 8LOCK NO. 1

	COVER TYPE	ACRES	*		COVER TYPE	ACRES
1	PIN 0-30	0.0	*	11	OEFOREST-8	111.1
2	PIN 31-50	102.2	*	12	OEFOREST-G	0.0
3	PIN 51-100	786.7	*	13	RECREATION	0.0
4	PIN 101-40	97.8	*	14	8ARREN	0.0
5	PIN 141+	0.0	*	15	8RUSHLANO	0.0
6	SPR 0-30	0.0	*	16	RANGE-HERB	26.7
7	SPR 31-50	0.0	*	17	PRIVATE	124.4
8	SPR 51	0.0	*	18		-0.0
9	SPR 101-40	8.9	*	19		-0.0
10	SPR 141+	0.0	*	20		-0.0
					TOTAL AREA	1257.8

PINE GROUP - 986.7 SPRUCE GROUP - 8.9 OEFORESTEO ACRES - 111.1

APPENDIX 4

Basic Information Used

Tabulations and explanations that follow describe the relationships to be determined locally to adapt TEVAP to other species or conditions. Each relationship appears in TEVAP as one or more FORTRAN statements for each species or working group. Descriptions include explanations of the 21 program variables and related FORTRAN statements involved. Tabulations include only enough entries to explain the nature of the information needed, and do not indicate sample sizes or desirable ranges of data. Methods used to determine the relationships are found in standard mensuration texts and elsewhere (Myers 1966, Myers and Godsey 1968).

1. Stand density after thinning—

One set of relationships is based on the basal area to be left after intermediate cuts for various average stand diameters. These relationships control thinning intensity, after THIN(I) and DLEV(I) have been specified by the program user. Initial data needed take the following form:

Average stand d.b.h. after cutting (Inches)	Basal area per acre	Average stand d.b.h. after cutting (Inches)	Basal area per acre
	Sq. Ft.		Sq. Ft.
2.0	12.1	6.4	60.3
2.4	16.7	6.8	63.8
2.8	21.3	7.2	67.0
3.2	26.0	7.6	69.8
3.6	30.6	8.0	72.5
4.0	35.2	8.4	74.9
4.4	39.9	8.8	76.7
4.8	44.5	9.2	78.2
5.2	48.8	9.6	79.2
5.6	52.8	10.0+	80.0
6.0	56.6		

Values in this tabulation represent a few points on one of a family of curves (Myers 1966). Reserve basal area increases with average stand d.b.h. until 10.0 inches d.b.h. is reached. Thereafter, reserve basal area remains constant for any one growing stock level. In the tabulation, constant basal area is 80.0 square feet per acre, and the values represent growing stock level 80. Other levels are named similarly. Thus, if THIN(I) or DLEV(I) is 100, basal area at any d.b.h. below 10.0 inches is the basal area for level 80 multiplied by 100/80. If d.b.h. is greater than 10.0 inches, retained basal area is DLEV(I).

Several statements in subroutine CUTS are derived from basal area values for level 80. They are multiplied by terms including THIN(I) or DLEV(I), redefined as REST, to provide for a range of possible growing stock levels. Variables defined by the statements, and their use, are:

a. DBHP—to find a d.b.h. less than 10.0 inches when basal area is known. Three equations for DBHP are used to simplify representation of the nonlinear relationship between d.b.h. and basal area.
b. BREAK and BUST—to compute values of basal area that are the upper limits of applicability of the first two equations for DBHP.
c. SQFT—to find basal area when d.b.h. is known. Two equations represent the nonlinear relationship for d.b.h. less than 10.0 inches.

Two equations used to compute LEVL in subroutine GOT include the equations for SQFT. They give the equivalent growing stock level when average d.b.h. and basal area are known.

2. Tree heights in well-stocked stands—

Average height of dominant and codominant trees, where height growth is not reduced by high stand density, is computed from data of the form:

Main stand age (Years)	Site index class 40	50	60	70
20	8	10	13	16
40	17	22	28	34
60 ...	26	33	41	49
150	50	62	73	85

The relationships are expressed by statements for HTSO in subroutine GOAL. If data from site index curves are used, the crown classes described must be the same as those used to develop the site curves. The crown classes must be the same as those used in the equations for total cubic feet, described below.

3. Tree heights with variable stand density—

Future average heights of dominant and codominant trees, without restrictions on stand density, are computed as FHT(1) by subroutine GOT. Heights in 10 years are estimated from present average height, stand age, site index, and basal area. Data needed for regression analysis may be obtained from remeasurements of permanent plots or from borings and ring counts on temporary plots.

4. Future average stand d.b.h.—

Diameter in 10 years is estimated from present average d.b.h., site index, and present basal area. Future diameters are computed as FDM(I) by GOT and as DBHO by GOAL. Data needed to obtain the prediction equations by regression analysis are gathered on temporary or permanent plots.

5. Increase in average d.b.h. from thinning—

Effect of thinning from below on average stand d.b.h. is simulated by subroutine CUTS. One set of changes, replacement of equations for DBHE and PDBHE, is needed to adapt the routine to other species. DBHE and PDBHE represent the same item, estimated d.b.h. after thinning. DBHE is computed directly if the estimated percentage of trees to be retained is at least 50 percent. With fewer trees retained, PDBHE is computed and its antilogarithm becomes DBHE.

Prediction equations are derived, preferably by computer, in the sequence listed below. Additional discussion and a slightly different procedure appear elsewhere (Myers 1966, Myers and Godsey 1968).

a. Convert a series of stand tables of actual stands to 1000 trees each. Known values may be: (1) the average d.b.h. of each one-inch class and the number of trees in the class, or (2) a list of 1000 tree diameters.
b. Compute average d.b.h. of each stand (DBHO).
c. Create a set of 1000 randomly arranged diameters for each stand. Arrange individual diameters or class averages, whichever is available from step a.
d. Create groups of trees, based on percentages of trees to be retained (PRET), and tally the largest diameter in each group. For example, if 25 percent of the trees are to be retained, divide the 1,000 randomly arranged diameters into 250 groups of four trees each. Tally the largest diameter in each group of four trees.
e. Repeat step d for various percentages of retention and for each stand.
f. Compute the average d.b.h. (DBHE) that results from each percentage retention (PRET) in each stand.
g. Use regression analysis to obtain equations that predict DBHE from DBHO and PRET.
h. Compare predicted and actual values of DBHE, using data from actual stands, to insure that adequate predictions can be made.

6. Noncatastrophic mortality—

Reduction in number of trees through normal mortality may be important in unthinned stands, but minor and erratic in thinned stands. Stands with an average d.b.h. of 10.0 inches or larger are assumed to have no accountable mortality.

Future stand density is computed as FDN(I) by GOT and as DENO by GOAL. Definitions and values of both variables change during record processing. The first computation, the equation that varies by species, produces percentage mortality in 10 years, expressed as a decimal. The 10-year period equals the projection period of related equations that estimate future diameter and height. Later, FDN(I) or DENO is redefined as future number of trees and is computed from the original value of FDN(I) or DENO. This is a programing convenience to avoid additional memory locations.

7. Total cubic feet per acre—

Stand volumes in total cubic feet are computed with stand volume equations. As used in TEVAP,

cubic volume is determined from: (1) basal area per acre, average height of dominant and codominant trees, number of trees, and average stand d.b.h., or (2) from basal area and height alone. Both sets of variables have been significant in analyses of actual data.

Values of five variables are obtained from the same stand volume equations: TOT(I), FVL(I), and TVL(I) in GOT and TOTO and TOTT in GOAL.

8. **Conversion of total cubic feet to other units**—Volumes are first computed in total cubic feet per acre, as described above. They are then converted to other units by subroutine VOLS. The second column, below, shows some of the ratios used to obtain equations for FCTR. The third column shows ratios used to compute PROD.

Average stand d.b.h. (Inches)	Merchantable cubic feet ÷ total cubic feet	Board feet ÷ total cubic feet
5.1	0.355	--
6.0	.552	--
6.9	.725	--
8.3	.860	0.99
9.1	.901	1.55
10.3	.931	2.38
19.0	.962	5.33
23.4	.969	5.88

Volume or weight per acre of numerous stands are determined in units of interest and in total cubic feet. Then, the quantity of each unit per total cubic foot is determined. Selection of appropriate units includes choice of minimum merchantable top diameters and d.b.h.

APPENDIX 5

An Example of Record Maintenance

Program GROW, listed below, is an example of the assistance provided by computers in the maintenance of records. Its purpose is to update inventory records if thinning or other change has not required replacement with a new record. New inventory data and updated data can then be combined for input to TEVAP. The new management guide produced will be based on the most recent estimates of forest condition for all plots or subcompartments. The guide can be produced during the winter, between growing seasons, before it is needed to plan the next season's work.

Inputs to GROW are always original records, not the results of previous projections. A 9999 is punched instead of the year of record on inventory cards with updated information. Records with very large values for year will not be processed by the program. Accidental mixture of original and updated records will not be perpetuated for use by TEVAP. This feature requires that two sets of inventory records be prepared for each working circle:

1. A permanent file of original data that is revised only by replacement of records. This file is revised continuously as work and inventory reports are submitted, and is the input file for GROW.
2. A temporary file consisting of data updated by GROW and of duplicates of original data that are too new to need updating. This file contains the inventory records to be used by TEVAP.

Use of two files increases the complexity of the record system, but avoids the compounding of projection errors.

Linear projections are used in GROW because other forms of the relationships are unknown. For example, a 2-year increase in diameter is assumed to equal two-tenths of the increase projected by an equation developed for a 10-year period. Projection periods, the variable TIME in TEVAP, should, therefore, be kept short, especially for fast-growing species.

GROW produces three kinds of output, as follows:

1. An inventory card with updated data is punched for direct use or for transfer to magnetic tape. Alternatively, the logical unit assigned to the punch may be assigned to a tape drive. Card images of the temporary inventory file are then written directly onto tape.
2. A copy of the card or card image may be printed, if desired. A nonzero value of DUPL is read to obtain the printed record.
3. A record of the number of cards processed is written after all other operations have been executed. The total does not include any previously updated records accidentally mixed with original data.

```
      PROGRAM GROW
     1(INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7=PUNCH,TAPE4=TAP
     2E5)
C
C TO UPDATE INVENTORY IF NO CHANGES EXCEPT NORMAL GROWTH HAVE OCCURRED.
C
C DEFINITIONS OF VARIABLES NOT ALREADY DEFINED IN PROGRAM TEVAP.
C     ADD = NUMBER OF YEARS TO PROJECT INVENTORY DATA.
C     AND = YEAR AFTER LAST GROWING SEASON TO BE PROJECTED.
C     DUPL = INDEX TO PRINT (1) OR OMIT (BLANK OR 0) NEW DATA.
C     NBR = NUMBER OF INVENTORY CARDS PROCESSED.
C
      DIMENSION AGE(2),BAS(2),DATE(3),DBH(2),DEN(2),FAG(2),FDEN(2),FDM(2
     1),FHT(2),FORET(3),HT(2),JFAG(2),JFDEN(2),JFDM(2),JFHT(2)
      KNTR = 0
      NBR = 0
C
C READ VALUES COMMON TO ALL CARDS.
C
      READ (5,1) (FORET(I),I=1,3)
    1 FORMAT (3A8)
      READ (5,1) (DATE(I),I=1,3)
      READ (5,2) RINT,DUPL,AND,NBK
    2 FORMAT (3F4.0,I4)
C
C INITIALIZE VARIABLES RECOMPUTED FOR EACH INVENTORY CARD.
C
   10 DO 11 I=1,2
      FAG(I) = 0.0
      FDEN(I) = 0.0
      FDM(I) = 0.0
      FHT(I) = 0.0
      JFAG(I) = 0
      JFDEN(I) = 0
      JFDM(I) = 0
   11 JFHT(I) = 0
      SBAS = 0.0
C
C READ INVENTORY CARDS. LAST CARD IS BLANK TO STOP PROCESSING.
C INVENTORY RECORDS ARE ORIGINAL DATA, NOT RESULTS OF PREVIOUS
C PROJECTIONS. VARIABLE WHEN IS ACTUAL DATE, NOT DUMMY ADDED BY THIS
C PROGRAM.
C
      READ (4,15) IBK,KOMP,ISUB,QTR1,QTR2,SECT,TOWN,RANG,SITE,STRY,NTYP,
     1WORK,DBH(1),HT(1),DEN(1),AGE(1),DBH(2),HT(2),DEN(2),AGE(2),ACRE,WH
     2EN
   15 FORMAT (I2,I4,I3,3A3,2A4,F4.0,F2.0,I3,F3.0,F4.1,F3.0,F5.0,F4.0,F4.
     11,F3.0,F5.0,F4.0,F5.1,F5.0)
C
C DETERMINE IF GROWTH PROJECTION CAN BE MADE.
C
      IF(IBK .LE. 0 .OR. IBK .GT. NBK) GO TO 140
C
C TEST DATE OF DATA SO PROJECTED DATA WILL NOT BE PROJECTED AGAIN.
C
      IF(WHEN .GE. 2000.0) GO TO 10
      NBR = NBR + 1
      ADD = AND - WHEN
      IF(ADD .EQ. 0.0) GO TO 80
      IF(DEN(1) .EQ. 0.0 .OR. DBH(1) .EQ. 0.0) GO TO 80
C
C COMPUTE FUTURE STAND VALUES.
C
      BAS(1) = 0.0054542 * DBH(1) * DBH(1) * DEN(1)
      BAS(2) = 0.0054542 * DBH(2) * DBH(2) * DEN(2)
      SBAS = BAS(1) + BAS(2)
      IF(NTYP .GT. 5) GO TO 30
      DO 20 I=1,2
      IF(DBH(I) .EQ. 0.0) GO TO 20
      IF(DEN(I) .EQ. 0.0) GO TO 20
      FAG(I) = AGE(I) + ADD
      IF(DBH(I) .GE. 10.0) GO TO 17
      FDEN(I) = 0.00247 + 0.00124 * DBH(I) + 0.00028 * DBH(I) * DBH(I) +
     10.00000521 * SBAS * SBAS - 0.0000905 * DBH(I) * SBAS
      IF(FDEN(I) .LT. 0.0) FDEN(I) = 0.0
      FDEN(I) = DEN(I) * (1.0 - FDEN(I))
      GO TO 18
   17 FDEN(I) = DEN(I)
   18 FDM(I) = 0.88511 * DBH(I) + 1.29735 * ALOG10(HT(I)) + 0.00119 * DB
     1H(I) * SITE + 62.37174 / SBAS - 1.56975
      FHT(I) = 15.43021 + 1.107 * HT(I) - 0.08637 * AGE(I) - 304.12172 /
     1SITE - 0.02447 * SITE * SBAS * 0.01
   20 CONTINUE
      GO TO 50
   30 DO 40 I=1,2
      IF(DBH(I) .EQ. 0.0) GO TO 40
      IF(DEN(I) .EQ. 0.0) GO TO 40
      FAG(I) = AGE(I) + ADD
      IF(DBH(I) .GE. 10.0) GO TO 35
      FDEN(I) = 0.05285 - 0.01346 * DBH(I) + 0.00226 * DBH(I) * DBH(I) +
     10.0000066 * SBAS * SBAS - 0.0001931 * DBH(I) * SBAS
      IF(FDEN(I) .LT. 0.0) FDEN(I) = 0.0
      FDEN(I) = DEN(I) * (1.0 - FDEN(I))
      GO TO 36
   35 FDEN(I) = DEN(I)
   36 FDM(I) = 0.2631 + 0.95287 * DBH(I) + 0.0016 * DBH(I) * SITE + 16.4
     16662 / SBAS
      FHT(I) = 14.57349 + 1.101 * HT(I) - 0.09654 * AGE(I) - 333.37172 /
     1SITE - 0.04321 * SITE * SBAS * 0.01
   40 CONTINUE
C
C CHANGE ORIGINAL VALUES TO THOSE EXPECTED IN ADD YEARS.
C
   50 TEM = ADD / RINT
      DO 51 I=1,2
      FDEN(I) = DEN(I) + (FDEN(I) - DEN(I)) * TEM
      FDM(I) = DBH(I) + (FDM(I) - DBH(I)) * TEM
      FHT(I) = HT(I) + (FHT(I) - HT(I)) * TEM
   51 CONTINUE
C
C CHANGE TYPE CODES AS NEEDED.
C
      MNK = 0
      IF(NTYP .GT. 5) MNK = 5
      J = 1
      IF(STRY .GT. 0.0) J=2
      IF(FAG(J) .GT. 30.0) GO TO 55
      NTYP = 1 + MNK
      GO TO 70
   55 IF(FAG(J) .GT. 50.0) GO TO 56
      NTYP = 2 + MNK
      GO TO 70
   56 IF(FAG(J) .GT. 100.0) GO TO 57
      NTYP = 3 + MNK
      GO TO 70
   57 IF(FAG(J) .GT. 140.0) GO TO 58
      NTYP = 4 + MNK
      GO TO 70
   58 NTYP = 5 + MNK
C
C CONVERT TO FIXED POINT FOR PUNCHING. RETAIN NECESSARY DECIMALS.
C
   70 DO 71 I=1,2
      JFDM(I) = FDM(I) * 10.0 + 0.5
      JFAG(I) = FAG(I) + 0.5
      JFDEN(I) = FDEN(I) + 0.5
      JFHT(I) = FHT(I) + 0.5
      FAG(I) = JFAG(I)
      FDEN(I) = JFDEN(I)
      FHT(I) = JFHT(I)
      FDM(I) = JFDM(I)
      FDM(I) = FDM(I) * 0.1
   71 CONTINUE
      GO TO 90
   80 DO 81 I=1,2
      FAG(I) = AGE(I)
      FDEN(I) = DEN(I)
      FDM(I) = DBH(I)
      FHT(I) = HT(I)
      JFAG(I) = AGE(I)
      JFDEN(I) = DEN(I)
      JFDM(I) = DBH(I) * 10.0 + 0.5
      JFHT(I) = HT(I)
   81 CONTINUE
   90 JSITE = SITE
      JSTRY = STRY
      JWORK = WORK
      JACRE = ACRE * 10.0 + 0.5
      JWHN = 9999
C
C PUNCH REPLACEMENT FOR INVENTORY CARD, USING NEW DATA.
C
      WRITE (7,91) IBK,KOMP,ISUB,QTR1,QTR2,SECT,TOWN,RANG,JSITE,JSTRY,NT
     1YP,JWORK,JFDM(1),JFHT(1),JFDEN(1),JFAG(1),JFDM(2),JFHT(2),JFDEN(2)
     2,JFAG(2),JACRE,JWHN
   91 FORMAT (I2,I4,I3,3A3,2A4,I4,I2,2I3,I4,I3,I5,2I4,I3,I5,I4,2I5)
C
C PRINT RECORD OF NEW INVENTORY DATA, IF DESIRED.
C
      IF(DUPL .EQ. 0.0) GO TO 10
      IF(KNTR .EQ. 50) KNTR = 0
      IF(KNTR .NE. 0) GO TO 120
      WRITE (6,110)
  110 FORMAT (1H1,//,43X,39HRESULTS OF PROJECTION OF INVENTORY DATA)
      WRITE (6,111) (FORET(I),I=1,3),(DATE(K),K=1,3)
  111 FORMAT (1H0,8X,3A8,40X,18HDATA PROJECTED TO ,3A8)
      WRITE (6,112)
  112 FORMAT (1H0,50X,29H**********OVERSTORY**********,3X,29H*********UN
     1DERSTORY**********,12X,5HORIG./1H ,2X,5HBLOCK,2X,4HCOMP,2X,4HSUBC,
     22X,4HSITE,3X,5HSTORY,3X,4HTYPE,3X,4HWORK,4X,3HDBH,4X,2HHT,5X,5HTRE
     3ES,5X,3HAGE,5X,3HDBH,5X,2HHT,4X,5HTREES,5X,3HAGE,5X,4HAREA,4X,4HDA
     4TE)
      WRITE (6,113) IBK,KOMP,ISUB,SITE,STRY,NTYP,WORK,FDM(1),FHT(1),FDEN
     1(1),FAG(1),FDM(2),FHT(2),FDEN(2),FAG(2),ACRE,WHEN
  113 FORMAT (1H0,3X,I2,5X,I3,3X,I2,1X,F6.1,3X,F4.1,5X,I2,4X,F4.1,2X,F5.
     11,1X,F6.1,2X,F8.1,2X,F6.1,2X,F5.1,2X,F6.1,1X,F8.1,2X,F6.1,2X,F7.1,
     21X,F6.0)
      KNTR = KNTR + 1
      GO TO 10
  120 WRITE (6,121) IBK,KOMP,ISUB,SITE,STRY,NTYP,WORK,FDM(1),FHT(1),FDEN
     1(1),FAG(1),FDM(2),FHT(2),FDEN(2),FAG(2),ACRE,WHEN
  121 FORMAT (1H ,3X,I2,5X,I3,3X,I2,1X,F6.1,3X,F4.1,5X,I2,4X,F4.1,2X,F5.
     11,1X,F6.1,2X,F8.1,2X,F6.1,2X,F5.1,2X,F6.1,1X,F8.1,2X,F6.1,2X,F7.1,
     21X,F6.0)
      KNTR = KNTR + 1
      GO TO 10
C
C RECORD THAT THE CHANGES WERE MADE.
C
  140 IF(DUPL .EQ. 0.0) GO TO 150
      WRITE (6,141) NBR
  141 FORMAT(1H0,//,5X,27HNUMBER OF CARDS REPUNCHED- ,I5)
      GO TO 160
  150 WRITE (6,151)
  151 FORMAT (1H1,////,43X,38HRECORD OF PROJECTION OF INVENTORY DATA)
      WRITE (6,152) (FORET(I),I=1,3)
  152 FORMAT (1H0,/,43X,16HSOURCE OF DATA- ,3A8)
      WRITE (6,153) (DATE(I),I=1,3)
  153 FORMAT (1H0,/,43X,18HDATA ADJUSTED TO- ,3A8)
      WRITE (6,154) NBR
  154 FORMAT (1H0,/,5X,27HNUMBER OF CARDS REPUNCHED- ,I5)
  160 CALL EXIT
      END
```

RESULTS OF PROJECTION OF INVENTORY DATA

BOGUS NATIONAL FOREST DATA PROJECTED TO JAN 2, 1970

							**********OVERSTORY**********				**********UNDERSTORY**********					
BLOCK	COMP	SUBC	SITE	STORY	TYPE	WORK	DBH	HT	TREES	AGE	DBH	HT	TREES	AGE	AREA	ORIG. DATE
1	1	1	40.0	0.0	3	2.0	5.7	32.0	829.0	78.0	0.0	0.0	0.0	0.0	-0.0	1965.
1	1	2	60.0	0.0	4	0.0	12.2	57.0	125.0	121.0	0.0	0.0	0.0	0.0	-0.0	1968.
1	1	7	40.0	0.0	5	4.0	9.2	49.0	318.0	149.0	0.0	0.0	0.0	0.0	-0.0	1967.
1	2	5	50.0	1.0	3	5.0	12.4	58.0	2.0	124.0	5.0	42.0	617.0	74.0	8.9	1966.
1	2	9	70.0	0.0	4	4.0	14.4	83.0	70.0	134.0	6.5	60.0	126.0	74.0	173.3	1966.
1	2	13	60.0	0.0	11	1.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	1965.
1	3	1	50.0	1.0	3	6.0	12.1	48.0	2.0	122.0	5.2	32.0	859.0	73.0	364.4	1967.
1	3	3	60.0	0.0	9	0.0	10.2	66.0	238.0	122.0	0.0	0.0	0.0	0.0	-0.0	1968.
1	3	6	70.0	0.0	11	1.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	1967.
1	3	10	60.0	0.0	3	0.0	10.7	59.0	204.0	94.0	0.0	0.0	0.0	0.0	320.0	1968.
1	6	1	60.0	0.0	4	0.0	10.1	60.0	236.0	104.0	0.0	0.0	0.0	0.0	-0.0	1966.
1	7	10	50.0	0.0	2	2.0	5.1	29.0	658.0	50.0	0.0	0.0	0.0	0.0	-0.0	1968.
1	9	14	50.0	0.0	3	2.0	6.1	31.0	419.0	52.0	0.0	0.0	0.0	0.0	-0.0	1967.
2	98	1	50.0	0.0	2	0.0	3.8	19.0	599.0	34.0	0.0	0.0	0.0	0.0	-0.0	1966.
2	98	4	60.0	0.0	3	2.0	6.2	49.0	1212.0	73.0	0.0	0.0	0.0	0.0	-0.0	1965.
2	98	13	60.0	0.0	4	0.0	10.3	66.0	238.0	129.0	0.0	0.0	0.0	0.0	-0.0	1966.
2	99	4	60.0	0.0	1	0.0	0.0	3.0	580.0	10.0	-0.0	-0.0	-0.0	-0.0	-0.0	1967.
2	100	1	60.0	0.0	9	2.0	11.5	61.0	227.0	105.0	0.0	0.0	0.0	0.0	-0.0	1965.
2	100	2	50.0	0.0	4	0.0	9.3	55.0	204.0	119.0	0.0	0.0	0.0	0.0	-0.0	1967.
2	100	4	50.0	0.0	1	0.0	3.0	11.0	1994.0	21.0	0.0	0.0	0.0	0.0	17.8	1969.
2	100	5	60.0	0.0	3	4.0	11.8	56.0	198.0	85.0	5.2	48.0	302.0	65.0	-0.0	1965.
2	100	7	60.0	0.0	4	0.0	10.4	69.0	238.0	125.0	0.0	0.0	0.0	0.0	-0.0	1965.
2	100	9	60.0	0.0	4	6.0	12.4	69.0	3.0	125.0	6.9	51.0	503.0	75.0	-0.0	1965.
2	100	16	50.0	0.0	5	4.0	13.8	60.0	101.0	144.0	0.0	0.0	0.0	0.0	-0.0	1965.
2	101	2	50.0	1.0	3	0.0	12.4	56.0	1.0	125.0	7.9	46.0	290.0	85.0	-0.0	1965.
2	102	2	50.0	1.0	2	6.0	14.2	55.0	10.0	121.0	2.2	22.0	2969.0	37.0	8.9	1968.
2	102	9	60.0	0.0	4	5.0	14.1	64.0	44.0	131.0	7.1	40.0	348.0	61.0	53.3	1969.
2	102	15	70.0	0.0	8	2.0	7.5	48.0	476.0	59.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	202	1	40.0	0.0	5	4.0	11.2	50.0	76.0	153.0	0.0	0.0	0.0	0.0	66.7	1968.
3	208	2	60.0	0.0	5	5.0	12.1	73.0	76.0	151.0	4.1	48.0	684.0	71.0	-0.0	1969.
3	207	10	70.0	0.0	5	4.0	17.0	87.0	36.0	153.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	203	11	60.0	0.0	3	2.0	5.4	52.0	998.0	81.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	203	9	60.0	0.0	4	0.0	7.3	64.0	372.0	108.0	0.0	0.0	0.0	0.0	-0.0	1967.
3	203	7	60.0	0.0	4	2.0	9.5	62.0	398.0	115.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	203	5	50.0	0.0	5	6.0	14.0	60.0	35.0	161.0	3.1	29.0	2272.0	51.0	40.0	1969.
3	203	3	70.0	0.0	3	2.0	8.3	64.0	448.0	85.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	203	2	60.0	0.0	4	2.0	8.4	64.0	395.0	110.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	203	1	50.0	0.0	5	4.0	11.6	56.0	124.0	144.0	0.0	0.0	0.0	0.0	31.1	1968.
3	202	9	60.0	0.0	3	2.0	2.8	39.0	4959.0	55.0	0.0	0.0	0.0	0.0	-0.0	1965.
3	202	8	50.0	0.0	4	0.0	10.0	56.0	68.0	115.0	1.9	26.0	1087.0	45.0	-0.0	1965.
3	202	7	60.0	0.0	3	2.0	5.3	30.0	858.0	52.0	0.0	0.0	0.0	0.0	13.3	1968.

NUMBER OF CARDS REPUNCHED- 41

Agriculture — CSU, Ft. Collins

Myers, Clifford A.
1970. Computer assisted timber inventory analysis and management planning. USDA Forest Service Research Paper RM-63, 53 p. Rocky Mountain Forest and RAnge Experiment Sation, Fort Collins, Colorado 80521.

Presents computer programs, written in Fortran IV, for analysis of inventory data, computation of actual and optimum growing stocks and allowable cuts, and computation of other values needed for forest management planning. Computed volumes and areas are summarized in a timber management guide that replaces a conventional management plan. Effects of cultural operations and other changes are accounted for in computation of both actual and optimum conditions.

Key Words: Allowable cut, forest management, stand yield tables, timber management.

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About The Forest Service. . . .

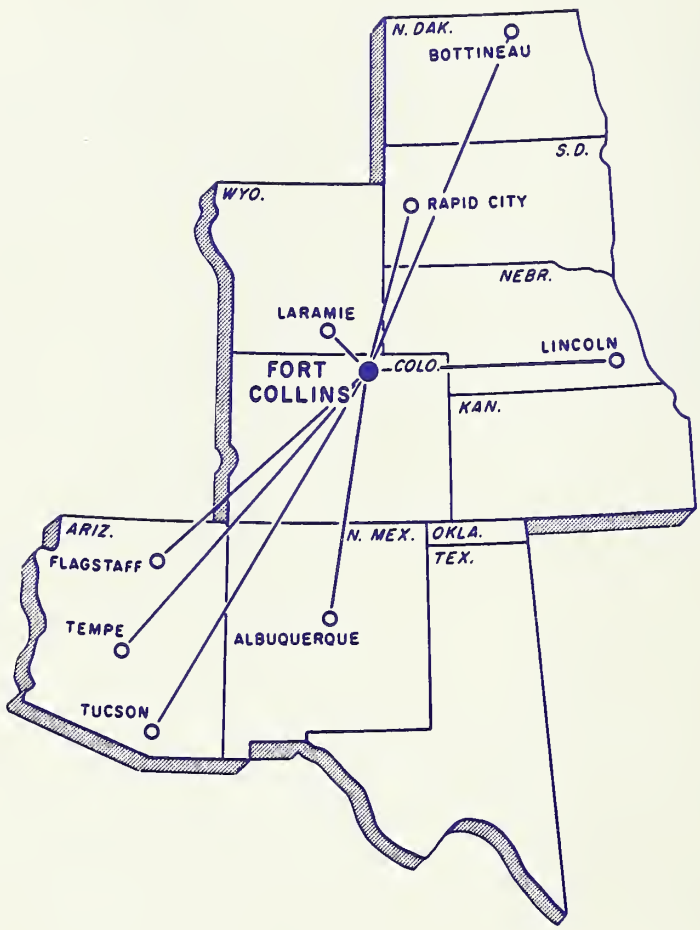
As our Nation grows, people expect and need more from their forests—more wood, more water, fish and wildlife; more recreation and natural beauty; more special forest products and forage. The Forest Service of the U. S. Department of Agriculture helps to fulfill these expectations and needs through three major activities:

- *Conducting forest and range research at over 75 locations ranging from Puerto Rico to Alaska to Hawaii.*
- *Participating with all State forestry agencies in cooperative programs to protect, improve, and wisely use our Country's 395 million acres of State, local, and private forest lands.*
- *Managing and protecting the 187-million acre National Forest System.*

The Forest Service does this by encouraging use of the new knowledge that research scientists develop; by setting an example in managing, under sustained yield, the National Forests and Grasslands for multiple use purposes; and by cooperating with all States and with private citizens in their efforts to achieve better management, protection, and use of forest resources.

Traditionally, Forest Service people have been active members of the communities and towns in which they live and work. They strive to secure for all, continuous benefits from the Country's forest resources.

For more than 60 years, the Forest Service has been serving the Nation as a leading natural resource conservation agency.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